ENVIRONMENTAL ASSESSMENT AND
FINDING OF NO SIGNIFICANT IMPACT

CASCADES RESOURCE AREA
INVASIVE NON-NATIVE PLANT MANAGEMENT

Environmental Assessment Number OR-080-02-02

February 2003

United States Department of Interior
Bureau of Land Management
Oregon State Office
Salem District
Cascades Resource Area
Clackamas, Linn, Multnomah, Marion Counties, Oregon

Responsible Agency:	USDI - Bureau of Land Management
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Abstract: This environmental assessment discloses the predicted environmental effects of two action alternatives for lands located in the Cascades Resource Area of the Salem District BLM. The proposed action is to implement an Integrated Invasive Non-Native Plant Management strategy to reduce and control invasive non-native plant species. Invasive non-native plant species pose an increasing threat to native ecosystems and other plant communities. While invasive plants have long been recognized as a problem for agriculture, the potential impact to other plant communities, including wildlands and riparian areas, is receiving greater attention. There are an estimated 2,000 invasive non-native plant species already established in the United States. All ecosystems (forests, rangelands, riparian areas, wetlands, etc.) are vulnerable to invasion.

Table of Contents

I. FINDING OF NO SIGNIFICANT IMPACT

A. Introduction

The project is within all land use allocations. The environmental assessment (EA) is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

Implementation of the project would conform to management actions and direction contained in the Salem District Record of Decision and Resource Management Plan (RMP). The RMP, dated May 1995, is tiered to and incorporates the analysis contained in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement* (*RMP/FEIS*) (September 1994). The proposed action and associated alternatives also conform to direction described in the attached EA.

The EA and FONSI will be made available for public review from February 14 to March 18**,** 2003. The notice for public comment will be published in a legal notice by a local newspaper of general circulation *(Statesman Journal*); sent to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making processes; and posted on the Internet at http://www.or.blm.gov/salem/html/planning/index.htm. Comments received in the Cascades Resource Area Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before March 18, 2003 at 4:00 P.M., Pacific daylight-saving time, will be considered in making the final decisions for this project. Office hours are Monday through Friday, 7:30 A.M. to 4:00 P.M., closed on holidays. The fax number is 503-375-5622.

B. Finding of No Significant Impact

Based upon review of the EA and supporting documents, I have determined that the project is not a major federal action and will not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27 and do not exceed those effects described in the *RMP/FEIS.* Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

Context. The proposed action is implementation of an Integrated Weed Management Plan to reduce and control invasive non-native plant species across the Cascades Resource Area. It includes manual, mechanical, chemical, and biological control of invasive species in a variety of habitats and land use allocations. High priority areas such as Areas of Critical Environmental Concern (ACEC), Research Natural Areas (RNA), Riparian Reserves and Late Successional Reserves (LSR) along with the general forest matrix (GFMA) will be treated to remove invasive and restore the sites with native species.

The discussion of the significance criteria that follows applies to the intended action and is within the context of local importance. Chapter 4 of the EA details the effects of the proposed action. None of the effects identified, including direct, indirect and cumulative effects, are considered to be significant and do not exceed those effects described in the RMP/FEIS.

Intensity. The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. **Impacts may be both beneficial and adverse.** The beneficial effects of the proposed action are that invasive species are controlled so that habitats are restored to native plant communities. Adverse impacts may be impacts to non-target species, which have adapted to communities altered by the presence of invasive species. None of the environmental effects disclosed above and discussed in detail in Chapter 4 of the EA and associated appendices are considered significant, nor do the effects exceed those described in the RMP/FEIS.

2. **The degree to which the selected alternative will affect public health or safety.** The use of herbicides will be done according to manufacturers labels in such a manner as not to affect public health and safety.

3. **Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** ACECs, RNAs, wetlands, and along wild and scenic rivers will be high priority areas for elimination of invasive species.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** A letter was sent out to over 50 individuals and groups explaining the scope of the proposal and soliciting input. This resulted in one phone comment from the public. The individual expressed support for the proposal and asked which herbicides were being considered and methods of application. The effects of the proposed action on the quality of the human environment were adequately understood by the interdisciplinary team. A complete disclosure of the predicted effects of the proposed action is contained in Chapter 4 of the EA and associated appendices.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The proposed action is not unique or unusual. Many methods of control have been tried for most of the invasive plant species. There is a vast amount of information on methods and procedures for control using chemical and physical methods, and biological agents. The environmental effects to the human environment are fully analyzed in the EA. There are no predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** The project does not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration.

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The interdisciplinary team evaluated the possible actions in context of past, present and reasonably foreseeable actions. Significant

cumulative effects are not predicted. A complete disclosure of the effects of the selected alternative is contained in Chapter 4 of the EA.

8. **The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.** The project will not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor will it cause loss or destruction of significant scientific, cultural, or historical resources (EA, Appendix B).

9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973** Pursuant to Section 7 of the Endangered Species Act, these projects will be consulted on with the United States Fish and Wildlife Service under the FY2003 Programmatic Habitat Modification and Disturbance Only Biological Opinions. Removal methods include sprayers. Activities near spotted owl sites are seasonally restricted.

   Consultation with the National Oceanic and Atmospheric Agency(NOAA) for the non-herbicide treatments was completed under the Programmatic Biological Opinions for the Upper Willamette river and Lower Columbia River Evolutionarily Significant Units. Consultation with NOAA Fisheries for herbicide treatments is in progress. Additionally, the project would incorporate any additional design features required as a result of the Terms and Conditions contained within the corresponding Biological Opinion.

10. **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The project does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment. State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. Furthermore, the project is consistent with applicable land management plans, policies, and programs.

Prepared By: Barbara Raible — 2-7-03
Barbara Raible, Cascades Resource Ecologist — Date

Reviewed By: Carolyn Sands — 2/7/03
Carolyn Sands, NEPA Coordinator — Date

Approved By: — Feb 7, 03
Brad Keller — Date
Cascades Resource Area Field Manager

II. ENVIRONMENTAL ASSESSMENT: CHAPTER 1.0 - PROJECT SCOPE

A. Introduction

The Cascades Resource Area of the Salem District of the Bureau of Land Management (BLM) proposes to implement an integrated weed management program. The project area includes the entire Cascades Resource Area (CRA) lands, approximately 177 thousand acres, which are located east of Salem in Multnomah, Clackamas, Marion and Linn County. The project area crosses many watersheds. See maps in Appendix H.

This EA will be effective from March 2003 until March, 2008.

The increase in invasive non-native plants and the impacts they are having on local lands and resources are causing concerns for public land managers and the public. New invasions of non-native plants and the spread of established infestations are threatening the productivity of public land. Management of invasive plants is important for maintaining healthy ecosystems.

B. Purpose of and Need for Action

The purpose of this management proposal is to implement an integrated invasive non-native plant management program that would maintain healthy functioning ecosystems by restoring native plant communities through reduction, control, and eradication of invasive plants. The program would include education about the risks and economic impacts of invasive plants and be economical to implement while protecting natural resource values and providing for human health and safety.

An integrated invasive non-native plant management plan is needed for several reasons:

- Federal law requires that the BLM manage invasive non-native plants (see H Conformance With Land Use Plans, Policies, and Programs.
- Additional control measures and emphasis are needed to limit the presence and impacts of certain invasive plants on the CRA. Serious ecological impacts are beginning to occur in a number of areas and large established sites are continuing to expand. Control methods for large sites would increase in cost and complexity as the sites expand.
- The trend over the past several years has been for a substantial increase in the number of visitors passing through or visiting public lands. This has contributed to an increased spread rate of invasive plants and the introduction of new species. This is expected to continue.
- The existing District management plan (Noxious Weed Control Program EA, March 1992-1997) is no longer adequate.
- Counties, private landowners, watershed councils, and other agencies are very concerned about the increase and impacts of invasive non-native plants on native species and economics.
- The current situation is generally still manageable.

Further descriptions of the purpose and need are detailed in Chapter 3 under affected environment resource descriptions along with descriptions of the target invasive plant species.

C. Proposed Action

The proposed action is to implement a long-term integrated invasive non-native plant management program on the following lands: federal lands within the CRA and non-federal lands within Multnomoh, Clackamas, Marion and Linn Counties involved in partnership projects with the BLM and using federal monies. The CRA would support and enter into these cooperative weed treatments proposed by non-federal groups on federal and non-federal lands (i.e. county payment projects using federal funds). Projects would be consistent with supporting public land objectives, cumulative benefits, and healthy watersheds. Invasive non-native plants know no boundaries so it is imperative that these partner opportunities are utilized. Sideboards would include following the same mitigation measures for any herbicide applications. Projects would be reviewed on a case-by-case basis to determine risks to human health, agricultural crops and the environment.

D. Project Objectives

The Salem District RMP (page 64) directs that invasive non-native plant infestations should be contained and/or reduced on BLM- administered lands using an integrated weed management approach that is in accordance with BLM Northwest Area Noxious Weed Control Program EIS and the related Record of Decision (1985). The second objective is to avoid introducing or spreading invasive non-native plant infestations. For all land allocations, control methods would be used which do not retard or prevent attainment of Aquatic Conservation Strategy Objectives.

The proposed action would implement the seven goals identified in Partners Against Weeds (an Action Plan for the BLM), January 1996.

Goal 1: Prevention and Detection

Goal 2: Education and Awareness

Implementation of Goals 1 and 2 are the foundation for a long-term successful weed management program. These goals are the priority for the integrated weed management program.

Goal 3: Inventory

Goal 4: Planning

Goal 5: Integrated Weed Management

Goal 6: Coordination

Goal 7: Monitoring, Evaluation, Research and Technology Transfer Program Implementation

E. Issues

A letter was sent out to over 50 individuals and groups explaining the scope of the proposal and soliciting input. This resulted in one phone comment from the public. The individual expressed support for the proposal and asked which herbicides were being considered and methods of application. The effect of herbicides was identified as an issue. The following elements of the human environment (see Appendix B) were analyzed and will be discussed in this document: soils and water, vegetation, wildlife and fisheries, recreation, visual, and roads.

III. CHAPTER 2.0 - ALTERNATIVES

A. Both Action Alternatives, including the proposed action (AlternativeA)

This project would implement a long-term integrated invasive non-native plant management program, and is designed to address the dynamic nature of invasive plants such as increasing numbers of species, different plant physiologies for the various species, and changing conditions of infestations.

1. Relation to Project Goals

To achieve the goals described in Chapter 1, the project includes the following strategies and actions.

Goal 1: Prevention and Detection and Goal 2: Education and Awareness -

- Implementing the Resource Area Weed Prevention Schedule (revised annually).
- Being a partner with County and State weed programs.
- Coordinating with County and State transportation departments.
- Implementing BLM and Oregon State education programs.
- Educating and working with contractors and public land users.
- Participating in local activities such as the County and State Fairs, Weed Awareness Fair, etc.
- Educational signing at all major recreation sites.

Goal 3: Inventory - Inventories would be conducted on a regular basis to identify new infestations, determine changes in rates of spread for established infestations, and which activities are the major contributors to the spread of invasive plants.

Goal 4: Planning - Program planning would be done annually to determine weed management strategies for the CRA's annual program of work.

Goal 5: Integrated Weed Management - Goals 1 and 2 cannot mitigate new or established infestations; therefore, it is important that these goals and the other goals be combined with the treatment of invasive non-native plants. Because Goal 5 has direct impacts on the environment, it is the focus of this EA.

Goal 6: Coordination - The District would coordinate weed management activities with local, State and Federal agencies, and private landowners. Coordination would include coordination for Goals 1 and 2, sharing of inventory and monitoring information, and developing annual treatment programs.

Goal 7: Monitoring, Evaluation, Research and Technology Transfer Program Implementation - Monitoring would be conducted annually to determine the overall effectiveness of the program, effectiveness of treatments, and compliance with laws, regulations, and policies. The District would continue to participate in weed oriented research projects and provide for technology transfer as opportunities arise.

2. Integrated Weed Management

The proposed action would utilize four primary methods for weed control: Cultural, Physical (including prescribed fire), Biological, and Chemical (Alternative A only). See Appendix E for a list of treatments that fall into these categories.

- Cultural Treatments: These treatments include prevention, wildlife management, and competitive plantings with native seeds/plants.
- Physical Treatments: Physical treatments include manual, mechanical, and burning treatments.
- Biological Treatments: These treatments include using natural competitors including insects and pathogens.
- Chemical Treatments (Alternative A only): Treatments include the use of herbicides.

a) Control Method Determination

Selection of the appropriate method would be based on such factors as the growth characteristics of the target plants, size of the infestation, location of the infestation, accessibility of equipment, potential impacts to nontarget species, use of the area by people, effectiveness of the treatment on target species, and cost. Depending on a plant's characteristics, these methods may be used individually or in combination and may be utilized over successive years.

Due to the length of seed viability, annual germination of seeds from previous years, and the characteristics of certain plants, treatments could occur annually for a period of 10 years or more.

Because weed infestations vary annually due to new introductions, spread of existing infestations and the results of previous year treatments, site-specific reviews would be conducted annually prior to initiating weed management activities. See Appendix A for a list of sites proposed for treatment in 2003.

b) Use of Physical Treatments

This is the preferred method if effective and cost efficient for particular species and sites.

c) Use of Biological Controls

Biological controls would be utilized in accordance with the Oregon Department of Agriculture (ODA).

d) Use of Herbicides (Alternative A only)

Herbicides that may be used are those approved in the Vegetation Treatment on BLM Lands in Thirteen Western States EIS, 1991, (page 17) or any that are approved through an amendment or other Agency approval process (see Appendix G). Application would take place only in accordance with the manufacturer's label and by qualified/certified applicators. Methods of application could include wiping or wicking, backpack sprayer, or ORV vehicle with a handgun or boom. No aerial application would be permitted under this proposal.

e) Priorities for Treatment

Inventories are conducted on the CRA to locate new infestations and to monitor the spread of known infestations. This inventory would be the basis for determining treatment strategies. The following priorities would also be based on coordination with local, tribal, State and Federal governmental entities, private landowners, and with local multiagency weed management plans.

- Priority 1: Eradication of new locations of weeds that are a known significant threat (as determined by the ODA and local County).
- Priority 2: Eradication of small infestations of weeds that are a known significant threat in areas that have a high potential for spread such as roads/trails (including rights-of-way), recreation sites, rivers/streams, and mineral material sites or have a high potential for ecological or economic impact.
- Priority 3: Containment of large weed populations.

f) Area of Treatment

The number of acres treated annually (approximately 100 to 500 acres) would be based on available funding, weather, and condition of the weeds. It is recognized that due to the nature of invasive plants and the size of the land base involved, invasive plants will never be permanently eradicated. The intent of this proposal is to manage invasive non-native plants at a level where they are causing negligible ecological or economic impacts. The goal for widespread, established species such as Scotch broom and Himalayan blackberry, is containment and limiting their spread.

g) Special Management Areas

Areas of Critical Environmental Concern (ACECs): Invasive plants would be treated in ACECs if it is determined that the invasive plants pose a threat to the values in the ACEC or pose a significant threat to the resources outside of the ACEC. Treatment strategies would be in accordance with direction established in the RMP and specific ACEC management plans.

Wild and Scenic Rivers and Table Rock Wilderness: Consideration for treatment of invasive plants in Wild and Scenic River corridors and the wilderness would be the same as ACECs.

Municipal Watersheds: Consideration for treatment of invasive plants would be done if it determined that the invasive plants are posing a threat to the health of the watershed. Treatment strategies would be coordinated with the municipal watershed managers.

h) Mitigation Measures

<u>Alternative A only</u>

1. When herbicide use is proposed adjacent to lakes or streams, buffer strips would be provided in accordance with the Record of Decision (ROD) for Vegetation Treatment on BLM Lands in Thirteen Western States, 1991, in accordance with the pending BO from NOAA Fisheries, and in accordance with labeled use.

2. Recreation sites may be temporarily closed while herbicides are applied and would be posted to notify the public of any hazards that may be present.

Both Action Alternatives

3. Following successful weed control, if adequate desirable seed or plant sources are not present to fill the voids left by the invasive plants, seeding or transplanting of seedlings of desirable species (preferably native species) would take place to fill the voids.
4. All sites proposed for mechanical treatments would be reviewed for impacts to cultural resources.
5. Use of motorized equipment in special management areas where motorized travel is prohibited would not be permitted.
6. All sites proposed for treatment would be evaluated for Special Status species
7. (Threatened, Endangered or Sensitive species). If any Special Status species are found, site-specific mitigation measures would be identified and implemented.
8. If Federally listed species occur within or near the treatment site, mitigation would be developed to eliminate effects on the species if possible. If affects to Federally listed species in excess of those described in the applicable BOs issued by the USFWS and NOAA Fisheries, then ESA section 7 Consultation would be reinitiated.
9. Activities in any sensitive areas for wildlife will be seasonally restricted.
10. BLM and/or contract vehicles and equipment entering treated lands would be cleaned prior to entry and upon departure after treatments. BLM Resource Area vehicles would also be cleaned on a regular basis to help prevent transport of seed sources.
11. Additional mitigation measures can be found in the EIS, Vegetation Treatment on BLM Lands in Thirteen Western States (1991).

i) Monitoring

Treated sites would generally receive short and long-term monitoring to determine effectiveness of meeting treatment objectives, impacts on nontarget species, and to determine the need for follow-up treatments.

If Special Status species are located near or within areas of herbicide application (Alternative A only), monitoring would be conducted to quantify impacts to the Special Status species.

B. Alternative B: Use of Control Methods that do not include Chemicals

This alternative would make available for use all of the treatments in Alternative A with the exception of chemical applications.

C. Alternative Dropped From Detailed Study

1. No Action

Under this alternative, no control measures would be implemented. This alternative was not analyzed because it was not considered viable. Federal law requires that invasive

non-native plants be controlled on Federal land: Federal Noxious Weed Act of 1974 as amended and the Carlson-Foley-Act of 1968.

IV. CHAPTER 3.0 - AFFECTED ENVIRONMENT

Chapter 3.0 describes the present condition (i.e., affected environment) within the project area for the following resource categories: soils and water, vegetation, wildlife and fisheries, recreation, visual resources and roads. Additional resources or values for which review is required by statute, regulation, Executive Order, or policy, are described in Appendix B: Elements of the Environment.

A. Soils and Water

1. Soils

Invasive non-native plants occur on all the different soil types throughout the area. Soils range from sandy and sandy loams to silty loams and clay loams to clays. Soils that have been disturbed (rock pits, heavily used recreation areas, harvested areas, and roadsides) have the greatest populations of invasive species. Some invasive plants, such as knapweed, can thrive on very poor, shallow soils and out-compete native vegetation.

Exotic species that alter hydrologic cycles, sediment deposition, erosion, and other ecosystem processes can cause serious ecological damage (Vitousek, 1986). Some plants such as salt cedar may lower water tables and trap more sediment than native plants altering water channels (Blackburn, 1982). Tap-rooted invasive species such as spotted knapweed can also increase surface runoff and soil erosion rates (Lacey, et al., 1989). Blackberry and English ivy out compete desirable species which have greater soil stabilizing capacity.

2. Water

Because water is so vital in ecosystems, invasions of non-native plants into wetlands and along rivers and streams can have major impacts on the entire riparian and upland ecosystems. The Cascades Resource Area (CRA) hosts over 2100 miles of streams, half of which support fish populations. In general, water quality of these streams is considered good. The streams are generally cold and clear. Sedimentation and turbidity are a concern in some areas and a few streams are listed as water quality limited by the Oregon Department of Environmental Quality. In addition to streams there are wetlands, ponds, marshes and some lakes on CRA lands. Many appear to be isolated from each other but are likely to be hydrologically linked by a common groundwater layer. These features, called “wet areas” may or may not contain fish. Many wet areas contain insects, amphibian, and reptiles that are important prey for numerous wildlife species.

According to the RMP the beneficial uses within Cascades Resource Area are resident and anadromous fish, municipal water, domestic, irrigation use, and water contact recreation. The predominant non-consumptive use of the water on ‘BLM lands is propagation of salmonids and other fish and aquatic life. There are several municipal watersheds within the CRA.

The Sandy River has many miles of riparian area, which are being invaded by knotweeds from the confluence with the Columbia to the headwaters. Knotweeds grow tall extremely fast (10 feet + in 2 months) and expand by rhizomes very rapidly. It can spread via root fragments and/or stems during floods, which allow it to quickly occupy newly deposited flood debris and

other disturbed sites and permanently replace slower growing native vegetation, even in undisturbed sites. Prime habitat for knotweed includes floodplains, back channels, and flood channels, any place where flood debris is deposited or where river water slows, in short, prime wintering habitat for salmonids. In Great Britain, France and many areas of the northeastern United States, knotweed has become the dominant species of riparian areas (Soll, 2001). This invasive plant infestation is at a point where it is still manageable if treated in the near future.

B. Vegetation

1. Forest

Non-native invasive species have invaded forest and riparian reserves mainly by the transportation system, although wind and animals are also vectors for moving the seed. Areas where the vegetation has been disturbed, whether naturally or by man, are the most susceptible. A dense cover of invasive plants can prevent native species from seeding in and reduce the biodiversity of a site.

Most of the project area lies within the western hemlock zone. Western hemlock is the major tree species that will replace itself over time. Douglas-fir and western redcedar are conifers associated with hemlock and numerous hardwood species such as red alder, big-leaf maple, and cottonwood. Most of the privately owned forestland has been logged within the last half century at least once.

The ***riparian reserve*** vegetation along the rivers actively interacts with the river providing a multitude of functions, including: slowing flood flows, filtering sediment, contributing organic materials, and providing hiding cover for fish. Riparian hardwoods also serve as important habitat for many bryophyte and lichen species that require a humid cool environment. As noted previously, invasive species such as the knotweeds, can completely dominate the riparian area and crowd out the native vegetation.

2. T&E, Special Status, and Special Attention Species

There are many known populations of BLM special status plant species in the CRA. Through time, the natural forces of rain, wind, and erosion created an environment of surprising complexity. The adaptive responses of plants to these environmental factors have resulted in a diverse and complex flora in many parts of the CRA. Moist and swampy areas (resulting from numerous springs) establish conditions for wetland plants while rocky south-facing openings offer hot and dry conditions.

Natural disturbances (fire, flood, and windstorm) have been frequent in the past. Such disturbances disassociate the stable plant communities causing many types and stages of plant succession, but these disturbed areas are highly susceptible to non-native plant invasions.

Most special status species cannot out compete non-native invasive species. Rare plants, such as tall bugbane (C*imicifuga elata)* that grows along roadsides, are susceptible to invasive weeds domination. One area in the Neal Creek area has a Himalayan blackberry population that is on the increase. The rare bugbane is at risk because the blackberry dominates.

3. Invasive Species

There are many invasive species that grow within the project area. These plants are very aggressive and become established quickly along road right of ways and other disturbed areas. The seeds from these infestations are easily spread by the traffic traveling along the roadways, birds, wind and water, especially during flood events into new areas where invasive non-native plants do not occur. These species are undesirable for a variety of reasons, including: 1) Invasive non-native plants take over native plant and animal habitats and reduce biodiversity. 2) Invasive non-native plants change soil conditions and can contribute to soil erosion. 3) They can cause allergic reactions and can cause injuries and 4) They cause economic losses in both agriculture and forestland.

Non-native plant invasions began a few centuries ago but primarily in the mid-1800's when non-native plants began arriving from other countries (new invaders continue to arrive here) without the natural enemies, such as insects and pathogens, that kept them in check in their country of origin. Consequently, these new plants are typically very aggressive and have the ability to dominate many wildland sites. For example, in its native habitat, purple loosestrife only comprises one to four percent of the native vegetation, but in North America densities of up to 80,000 stalks per acre have been recorded (Strefer, 1996). Thus, purple loosestrife out competes and forces out native plant species and reduces biodiversity (Nyvall, 1995). Weeds commonly invade the most productive sites such as riparian areas, benches along streams and rivers and other sites with deep, fertile soils.

Several invasive perennial weeds, including spotted, diffuse and Russian knapweeds, leafy spurge, and yellow starthistle are moving into excellent condition stands of native vegetation (Harris, 1991). Several exotic weeds will invade undisturbed climax communities and can become significant components of a community (Bedunah, 1992). False brome is behaving like this in the Willamette Basin, where it invades shaded forests, oak prairies and riparian habitats.

Monitoring has shown that nonchemical treatments have not been fully successful in eradicating or controlling many past and existing invasive non-native plant infestations. The prevalence of current invasive non-native plant infestations is extensive and persistent enough that all control options need to be considered.

The following species are currently found on the Cascades Resource Area and will be managed to eradicate or control them.

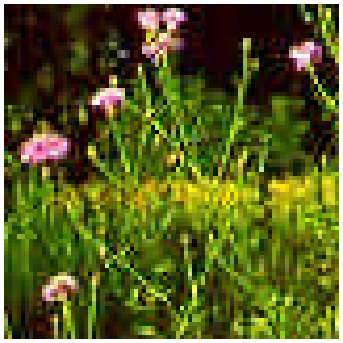
Photo by Saundra Miles

Japanese Knotweed *(Polygonum cuspidatum*, Giant knotweed and Himalayan knotweed) - These species are natives of Asia and were introduced to the United States as an ornamental and have now escaped cultivation. This species invades roadsides, waste areas, streams, ditch-banks, old homesteads, and pastureland. They are aggressive plants and are difficult to control once they establish. Japanese knotweed is a stout perennial that spreads from long creeping rhizomes. The stems are stout, reddish-brown, 4 to 9 feet in length. The plant is 2 to 10 feet tall with a mound of medium green foliage with 20 to 36 inch long plumes rising above the foliage. The flower plumes are visible in August to October. The foliage dies in the winter.

Knotweeds are a high threat for four reasons: 1) They spread via root fragments as small as 1 cm; 2) They evolved to rapidly colonize fresh sediment deposits; 3) They rapidly grow to 3 meters tall or more, effectively shading and excluding native vegetation; and 4) They have proven to successfully form monocultures in areas with similar climates.

Scotch Broom (*Cytisus scoparius*)– This species is very wide spread in western Oregon and the coast. It was originally introduced as an ornamental that escaped cultivation in the landscape. This aggressive plant is native to Europe and has become a nuisance in pastures, fields and forest areas, crowding out many native plants. Of all the invasive non-native plants in Oregon, Scotch broom is responsible for more economic loss than any other species in the State. A perennial, woody deciduous shrub with many branches, it grows from 3 to 10 feet. It is present throughout all the CRA watersheds and is abundant along roadsides and harvested parcels. Without repeated investments of $100 per acre, Scotch broom partially blocks reforestation efforts and reduces growth rates of surviving trees on some timber harvest units in western Oregon by competing for essential nutrients, such as phosphorous, without donating any of the nitrogen produced until plants are dead and decaying. Its height along roads interferes with user safety by reducing sight distance.

Himalayan Blackberry (*Rubus discolor = procerus*) **& Evergreen Blackberry** *(Rubus laciniatus)* – It is thought that Himalayan blackberry is a native of Western Europe and was probably first introduced in North America as a cultivated crop. The scrambling habitat of these two species smothers and kills desirable vegetation. The tangled mass of thorny stems block access for human, livestock and equipment to pastures, waterways, and other areas. Blackberries have often invaded forestland where harvesting opens up large areas. Many animal species feed on blackberries, consequently seeds are easily spread from one area to another in animal droppings. Seeds have a hard seed coat that can remain dormant for an extended period. Himalayan blackberry can produce 7000-13000 seeds per square meter. Once seeds germinate, grow, and the plants become established, expansion of the thicket is almost entirely due to vegetative growth from rhizomes. Over time a single plant may cover very large areas. Blackberry plants can live for 25 years or more. They produce vines that arise from a central crown or form buds along rhizomes (horizontal, underground shoots). First year canes do not produce flowers. In the second year, the canes fruit and die. Tips of the first year canes that contact the ground form roots.



Spotted Knapweed (*Centaurea maculosa)* A biennial or short-lived perennial composite with a stout taproot. It has 1-20 slender, upright stems, 3-10 dm tall, most branching in the upper half. Seedling leaves form a rosette. The slender tubular flowers are whitish to pink or purplish. Old flower stems can persist and old seed achenes remaining on old stems can aid with species identification when plants are overwintering as rosettes. The competitive superiority of this species suggests preadaptation to disturbance. The initial invasion of spotted knapweed, like other invasive non-native plants, is correlated highly to disturbed areas. Once a plant or colony is established though, it may invade areas that are relatively undisturbed or in good condition with gradual, broad, frontal expansion. Widespread invasion of spotted knapweed often results from overgrazing. The knapweed is highly adept at capturing available moisture and nutrients, and it quickly spreads, decreasing the water storage capacity of the soil and increasing soil erosion. Although the quality of the land being invaded does not seem to be able to exclude spotted knapweed, it probably does affect the rate of spread of the infestation (Weeds on the Web, TNC). Spotted knapweed primarily spreads by peripheral colonization of infested areas. It has spiny seedheads, which may be transported on animal hair or fur. Plant fragments also become attached to vehicles and equipment and spread seed for hundreds of miles. Off-road or recreational vehicles may damage existing vegetation and increase soil disturbance. Hikers and hunters can spread seed by picking the flowers or transporting contaminated hay for horse feed.

Meadow Knapweed *(Centaurea jacea x nigra)* Meadow knapweed is a perennial plant growing from a woody root crown, with 20 to 40 inch tall upright stems. Because meadow knapweed is a hybrid the following plant traits can be highly variable. As with other knapweed species, meadow knapweed is proving to be an aggressive and invasive species. It primarily invades pastures and meadows. It has become a common roadside plant in portions of the CRA. Meadow knapweed occurs in Europe as a hybrid between black and brown knapweeds. Reports from British Columbia suggest that meadow knapweed may have been brought in through contaminated alfalfa seed, but the exact method and date of introduction are unknown. It has also been suggested that it was introduced into Oregon as a forage plant called “bull clover”.

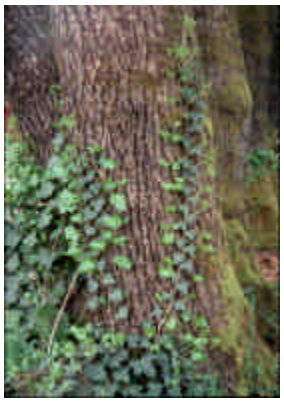


Photo by Saundra Miles

English Ivy *(Hedera helix)* and other ivys. The vine of this perennial plant will grow to be 6
to 8 inches high if on the ground, but will grow 90 feet high on trees. The plant grows in direct and indirect light. Its habit is to be a either a low-growing vine, rooting at every node, or a high climber, attaching itself to structures with root-like holdfasts. It is a fast grower and survives most soil types. English ivy is a very common plant that has been incorporated into many home landscapes around Oregon. It is very aggressive and can form a very thick mat on the ground, squeezing out other plants. Vines will cover other plant materials and climb trees and bushes.

False Brome (*Brachypodium sylvaticum)* is a perennial bunchgrass native to North Africa and Eurasia, and has recently been reported as rapidly invading coniferous forest understories in western Oregon. Occasionally cultivated for ornamental purposes, false brome was first collected as an escaped invader in North America near Eugene, Oregon in 1939 (Chambers 1966). By 1966, it was well-established in two large colonies near Corvallis, Oregon and since then has been quickly increasing in cover and range. It is now spreading into closed-canopy coniferous forests, riparian forests, forest edges, and upland prairies in full sun in Oregon's Willamette Valley and into the Cascade foothills (Kaye 2001). It has the potential to spread throughout low elevation forests in the Pacific Northwest (Oregon, Washington, Idaho, British Columbia), and could spread into northern California too.

The species has exceptionally broad ecological amplitude, occupying forest floor and open environments such as pastures and prairies at a variety of aspects and elevations. Populations are known from riparian forests as well as upland hardwood and conifer forests under patchy and closed canopies at elevations of 200-35oo feet. Vigorous populations also occupy forest edges and upland prairies in full sun. When invading an area, it may first disperse along roadsides and then move out into undisturbed areas of forest clearcuts. The palatability of this grass for wildlife appears to be very low. It may inhibit tree seedling establishment and displace threatened and endangered species, such as Kincaid's lupine (host plant for the endangered Fender's blue butterfly). This brome also has the potential to change fire behavior, since it can increase fine one-hour fuel loads.

Other non-native invasive plants include common mullein, tansy ragwort, St. John's wort, Canadian and bull thistles, butterfly bush, and reed canarygrass. Gorse was found and eradicated in the Wildcat drainage on public land. Occasional diffuse knapweed, spotted knapweed and meadow knapweed plants have been hand-pulled on along Highway 26. No known inventories for these other invasive plants have been conducted on non-federal lands within the project area. New invasive plants are being identified as soon as possible on public lands.

Current level of infestations: An inventory on resource area lands is done every five years if funding allows. The last inventory data from 1998 and 1999 was converted to a spatial map of locations in GIS. A standardized database will be created that can be shared among various agencies and groups.

C. Wildlife and Fisheries

1. Wildlife

The CRA provides diverse habitat for the full complement of wildlife species. The different ages classes and dominant tree cover of the forests offer many different habitats, along with special habitats such as meadows, rock outcrops, and cliffs. Because of BLM's checkerboard ownership interspersed with industrial private lands and private rural urban interface, these forested lands sometimes provide important refugia for certain older forest associated species. Riparian habitats provide important travel connections for wildlife movement. Non-native invasive species impact wildlife by reducing forage, modifying habitat, or changing how a species interacts within the environment. When a species such as false brome, dominates the vegetation, it may have negative effects on small and large mammals, native insects, lizards and snakes, and even song-birds. Another example, purple loosestrife reduces desirable waterfowl plants such as cattails that are preferred habitats for muskrats and long-billed marsh wrens (Rawinski and Malecki, 1984). Waterfowl broods are also more susceptible to predation because dense stands of purple loosestrife reduce access from water to nesting sites.

Few species rely exclusively on habitat provided by the often sparsely vegetated, highly disturbed area immediately adjacent to roadways, areas most often occupied by non-native species. However, many species do live in areas adjacent to roadsides or they may occasionally use roadside non-native habitat, so the alternatives proposed in this analysis have the potential to affect these species.

It is unknown to what extent big game species (deer and elk) utilize invasive non-native species for forage or large invasive species like scotch broom or non-native blackberries for cover.

Special Attention Species

The peregrine falcon, a Bureau sensitive species is likely to occur. It has been documented in the northern watersheds of the Cascades and in the higher elevations. Cliffs qualify as suitable habitat in the watershed. Bald eagles (listed threatened) are also present. The effect of invasives on these birds would be through their prey base by altering mammal and bird habitat.

The northern spotted owl is associated with older forest habitat. The CRA has many acres of nesting, foraging, roosting, and dispersal habitat within its boundaries. Forest openings are the most susceptible to invasion. The invasive plant impact on these birds would be similar to the falcon and eagle.

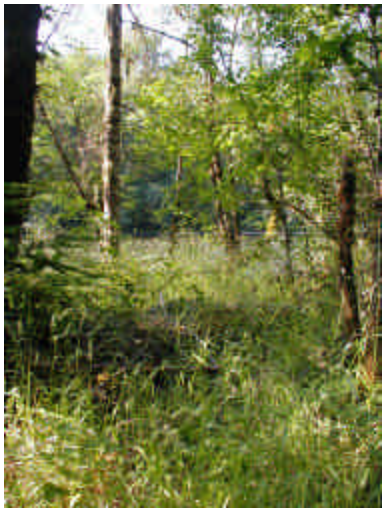
Migratory birds, Survey and Manage mollusks, salamanders and frogs are found throughout the resource area. These species depend on native herbaceous vegetation for food, nesting, or cover, which may be affected by the spread of non-native invasive species and by control measures. Non-native invasive infested areas generally do not provide high quality wildlife habitat due to the lack of vegetative diversity and the poor palatability of these invasive species. Small mammals and amphibians are more likely to be displaced because of their small home ranges.

2. Fisheries

The fishery values of the Cascades Resource Area are important for the diversity of runs and populations and quality of spawning and rearing habitat. There are many regionally important fisheries. Most native stocks of salmonids are greatly reduced from historic levels due to habitat degradation, heavy fishing pressure (ocean and river), and ocean survival conditions. Native stocks may also have been weakened by hybridization and competition with introduced hatchery stocks. (Molalla River WA, 1999) Due to their sport and commercial value, much more information exists for salmonid fishes (salmon, trout, char, and whitefish) than for other groups.

The Cascades Resource Area contains populations of at least six stocks of anadromous fish species, as well as resident species. Much of the habitat within river segments on BLM lands is considered good to excellent, and provides nearly ideal conditions for anadromous fish species. Riparian vegetation on BLM lands contributes to generally good stream shading because of the riparian buffers that have occurred even on managed lands.

Invasive species, such as the knotweed on the Sandy River, are beginning to alter the vegetative composition along the river. Floodplain function, sediment delivery, erosion potential could all be affected. Efforts to restore fish habitat may be impaired if dense patches of false-brome are present. The grass may reduce establishment of planted riparian trees that provide shade and structure to streams.



False brome invading a riparian area.

D. Recreation

The CRA has a range of recreational uses from wilderness to developed campgrounds. Use of the area has been rising at rates at least as great as the rate of population growth for Portland. Some of the main recreational uses within the CRA are fishing, hunting, hiking, river rafting, picnicking, swimming, nature study, camping, and scenic driving. Old rock quarries on some BLM lands are used for target shooting.

Hiking trails are more difficult and costly to maintain with heavy infestations of scotch broom and/or blackberry. Invasive non-native plants also distract from the scenic quality. A large expanse of scotch broom instead of trillium on a forest floor of oxalis can alter aesthetic values while hiking.

E. Visual

Several areas of the Cascades Resource Area are especially scenic, which has resulted in congressional designations of segments of wild and scenic rivers. Segments of the Sandy River, the Salmon River, and Quartzville Creek were designated for outstanding scenic values along with the Mt. Hood Corridor. Many people drive the forest roads to appreciate the scenic forest.

Public lands are classified for visual resource considerations. Special features, recreation visitation, viewpoints, landform, character and modifications to the landscape are considered when lands are classified. A Visual Resource Management (VRM) classification system was used to inventory all of the BLM-administered lands in the Salem District. (RMP map No. K). Invasive non-native plants are located along most roads in the CRA and detract from the scenic quality.

F. Roads

The BLM has almost 1000 miles of roads across the publicly owned lands in the CRA. There are over 23,000 miles of road within the larger resource area boundary that encompasses all ownerships and four counties. Many access roads are owned by private forest industry and are now gated.

The roadsides in the CRA have the highest occurrence of non-native invasive species. Vehicles provide the best vector for moving seeds of many invasive plants. Safety issues can arise when the scotch broom becomes tall enough to block line of sight.

V. CHAPTER 4.0 - ENVIRONMENTAL EFFECTS

Chapter 4.0 summarizes the changes that can be expected as a result of implementing the alternatives. The environmental effects (changes from present base line condition) that are described in this chapter cover the following resource categories: soils and water, vegetation, wildlife and fisheries, recreation, visual resources and roads. For those resources or values which review is required by statute, regulation, Executive Order, or policy, Appendix 1 contains the appropriate documentation as to the effects of the project on those resources or values.

A complete listing of the consequences can be found in the EIS, Vegetation Treatment on BLM Lands for Thirteen Western States, 1991 (VEIS). No impacts have been identified which exceed those addressed in this EIS. For a full discussion of the physical, biological, and social resources of the Salem District, refer to *RMP/FEIS.* The discussion in this document is site-specific[1] and supplements the discussion in the *RMP/FEIS* and the *VEIS.* Resource values are not identified in this section when there are no site-specific impacts, site specific impacts are considered negligible, or the cumulative impacts described in chapters 3 and 4 of the *RMP/FEIS* are considered adequate.

A. Soils and Water

1. Alternative A (Proposed action)

Cultural, physical, and biological treatments: Cultural, physical, and biological treatments should have negligible impacts on water quality. Handpulling of plants would cause minimal, short-term disturbance of soil and undetectable impacts to water quality. Mechanical mowing or addition of biological control agents would not affect soil and water resources. With prescribed fire, there is a potential for minor, localized soil erosion as long as the fire is not in a highly susceptible area such as a steep slope. Competitive plantings along roadsides would reduce the area open for soil erosion and improve soil stability.

Chemical Treatments: By following the manufacturer's label on herbicides, following the project design and mitigation measures, no negative impacts on water resources or water quality are anticipated. When herbicide application is used near or adjacent to surface water, some contamination could occur. If Glyphosate (currently the only herbicide approved for use adjacent to water) were to enter the water it could have a minor affect on some aquatic species for a short period of time. Application techniques and timing would be chosen to minimize risk of water contamination. (VEIS, 1991) The risk of any negative impacts is considered to be very low and reduced with the project design and with mitigation measures (see Mitigation Measures, page 5).

Some herbicide residue could enter waterways through overland flow if a large rain event occurred shortly after application. The risk of negative impacts would be minimal because of rapid dilution. Water quality could also be degraded following the removal of invasive non-native plants and prior to revegetation of the site. The impact to beneficial uses should be

[1] This EA does not attempt to re-analyze all possible impacts that have already been analyzed in the *RMP/FEIS,* but rather to identify the particular site specific impacts that could reasonably occur.

minimal. No adverse impacts to floodplains have been identified. Again the risk is reduced with implementation of the Mitigation Measures (page 5).

2. Alternative B

Cultural, physical, and biological treatments: The effects of cultural, physical and biological treatments are identical to Alternative A.

Chemical Treatments: There would be no potential risk of contaminating soil and water resources because no herbicides would be used. If the invasive species are treated only through manual/mechanical treatments, some populations will continue to expand and replace native species on BLM and other ownerships. Depending on the species and its relationship to conditions around it, undesirable results could occur. For instance, spotted knapweed is generally not a dense cover and produces compounds to prevent other plants from growing near it; therefore, much of the soil is left bare and more susceptible to erosion. The knotweeds can completely take over a site, especially on streamsides. The indirect and cumulative effects would be the loss of native vegetation, which is adapted to the soil and water conditions present on the site. Native plants root systems hold the soil in place to help prevent excessive erosion and increased sedimentation into streams.

B. Vegetation

1. Alternative A (Proposed Action)

Targeted Species (see Invasive Species, page 10): Mortality or severe injury of plants, eradication, reduction or control of populations, and reduction and/or prevention of seed production would be the direct effect to targeted invasive non-native plants from all treatment methods. Biological treatments and manual control methods would generally only affect targeted species.

Non-Targeted Species: Mechanical treatments could impact non-targeted species if mowing or discing is used. Some non-targeted plants may also be killed or injured as a result of herbicide exposure or burning. Various plant groups and species are affected differently by different herbicides. For specific effects by the various chemicals that are approved for use see the EIS, Vegetation Treatment on BLM Lands in Thirteen Western States (1991). If invasive plants were to be treated near known sites of special status species, manual or biological control methods that cause the least damage would be used.

Overall Landscape: The indirect and cumulative effects of the proposed action would be that over time native habitats would be restored. The use of an integrated weed management system is not expected to prevent the attainment of the Aquatic Conservation Strategy Objectives, but to accomplish the objectives. (See APPENDIX C: AQUATIC CONSERVATION STRATEGY OBJECTIVES). The proposed action would be a better landscape level management approach because it proposes to manage invasive non-native species more effectively by using the most effective control or eradication treatment.

2. Alternative B

Targeted Species (see Invasive Species, page 10): Impacts would be the same as Alternative A except that the ability to eradicate or control some target species effectively or completely may be eliminated.

Non-Targeted Species: There could be adverse effects to sensitive plant populations if invading weeds, which cannot be controlled without the use of herbicides, were to compete with sensitive plants.

Overall Landscape: If a species is not effectively controlled on a landscape level, the ability to get it under control is unlikely. An example would be the knotweeds on the Sandy River, which have invaded nearly every mile of the river, and without herbicide treatments could eventually occupy all the space not covered by forest along the river. It will dominate the streamsides of the Sandy River or other waterways and prevent native species from growing. (TNC report, 2002)

C. Wildlife and Fisheries

1. Alternative A (Proposed Action)

Most impacts to some birds and mammals would result from the loss of nontarget vegetation if large areas are treated by fire. This could be mitigated by the intensity of the prescribed fire. The impacts would be loss of cover and/or food. These impacts would not be extensive enough to affect populations because the acreage to be treated would not be large enough. Over the long term, the effects of non-native invasive plants control would be beneficial because they would help restore degraded habitats and plant communities and prevent additional areas from being degraded due to these invasions.

Chemical treatments are generally applied in a form or at such low rates that they do not affect herbivores. However, there is potential for bioaccumulation, or slow uptake into the food chain, with some herbicides if used repetitively. This would be minimized by use of the herbicides in accordance with the labels.

Controlling invasive non-native plants and encouraging native plant growth would provide higher quality habitat for many wildlife species, including migratory species as well as ensure future productivity and use of the land for wildlife. Mowing of ditches could disturb ground-nesting birds and remove cover from burrow-dwelling animals. The noise disturbance associated with mechanical removal could disturb sensitive breeding sites for spotted owls or bald eagles. Seasonal restrictions would be used near known sites (see Mitigation Measures, page 5). The use of biological controls, competitive plantings, fire and hand pulling of individual plants should not negatively affect any fish or wildlife species. The use of biological controls is not expected to disrupt native insect populations. All introduced insect species are tested for host-specificity and competition with native species.

The greatest possibility for directly, indirectly or cumulatively affecting wildlife species, as a result of implementation of this alternative would be immediately following the application of

herbicides. The isolated use and application procedures (spraying individual plants and/or wicking) would help to prevent herbicides from reaching streams and affecting fisheries. The risk to wildlife species would be a risk of sickness or death as a result of being inadvertently sprayed with the herbicide (a very low to non-existent risk in hand or ground based application), the risk of sickness or death as a result of dermal exposure (walking through treated vegetation), inhalation, or the risk of ingesting treated vegetation during the period when the herbicide is active. These risks are considered low because of the methods of application and the low number of acres treated. (VEIS, 1991)

A continuous spread of invasive non-native plants would have different short and long-term impacts on birds and terrestrial mammals. In the short-term, direct, indirect and cumulative effects on these species would be negligible. Over the long-term, species dependent on native herbaceous vegetation could be directly impacted by reductions in forage or cover. For example, seed-eating birds or small mammals such as voles could be negatively impacted by losses of seed food source as native vegetation is slowly replaced by invader weed species. Ground nesting birds could be negatively impacted by losses of cover provided by native vegetation. Predators such as red-tailed hawks or weasels could be indirectly impacted by a decline in their prey species.

Removal of invasive non-native plants along waterways will contribute to improved biodiversity in the riparian vegetation, which would provide high quality habitat for fish and wildlife.

2. Alternative B

This alternative will have the same benefits and consequences to wildlife and fisheries as the previous alternative with the exception of the herbicides. Without the use of herbicides this alternative is not expected to slow the spread of some invasive weeds before adverse, negative impacts to wildlife and fisheries habitats are noted. An example would be Japanese knotweed along the Sandy River.

D. Recreation

1. Alternative A (Proposed Action)

The recreating public could be inconvenienced by temporary closures of recreational facilities during and following chemical treatments and potentially some mechanical treatments. Recreationists would not be exposed to chemical treatments. Elimination and control of invasive non-native plants and promotion of native vegetation should serve to maintain a high quality experience for recreating visitors. It would also reduce weed spread to other recreation sites

The indirect and cumulative effects would be high quality experiences for visitors.

2. Alternative B

Direct effects could still include closures, but are less likely with manual and mechanical treatments unless safety near machines was an issue.

Indirect and cumulative effects could include the loss of the recreational and educational opportunities that the control of some invasive species might offer.

E. Visual

1. Alternative A (Proposed Action)

The scenic quality within the CRA is outstanding with its steep topographic relief and varied and diverse vegetation. The control and eradication of invasive species would enhance the scenic quality.

Scenic quality would not be reduced or altered unless large acreages were burned or where total plant mortality occurred. These visual impacts would be short duration (one or two years) while the site is restored with native vegetation. Where individual plants or small groups of plants are treated, the effect would most likely not be noticeable to the casual public land user. Natural seeding as well as planting and seeding would follow treatments.

2. Alternative B

The impacts would be similar to the proposed action with the exception that some invasive plants may not be controlled with cultural, physical and biological treatments alone.

F. Roads

1. Alternative A (Proposed Action)

Since many roadsides are mowed, the impacts to roads would not be greater under Alternative A if herbicides were used to control invasive plants along roadsides. Safety would be improved because vegetation could be controlled through a number of methods. Species, such as Scotch broom have a higher likelihood of carrying fire away from the road, so control of all roadside vegetation is important in highly-used areas.

Indirect and cumulative impacts could be that road equipment or vehicles would no longer carry invasive plant seeds from area to area if control was achieved.

2. Alternative B

The impacts would be similar to the proposed action with the exception that some invasive plants may not be controlled with cultural, physical and biological treatments alone.

G. Cumulative Impacts

Both Alternatives: The cumulative effects of the proposed action would result in 1) a higher education and awareness level of the current invasive non-native plant problem, 2) a better inventory, 3) a reduction in new weed infestations, 4) containment and reduction of large

infestations, and 5) improved ecosystem health for uplands and riparian areas throughout the District. The application of biological, physical, and cultural methods would have no significant negative cumulative impacts.

Alternative A: If herbicides are used there is a higher probability that there will be a reduction in new weed infestations and the certain invasive species (i.e., knotweed and knapweed) can be controlled. If herbicides are applied improperly, there is potential for negative cumulative impacts from the use of chemicals when considered along with private, State, tribal, and other Federal applications within and outside the District. Coordination with other applicators and the use of certified personnel would minimize long-term cumulative impacts on human health risks.

Alternative B: The effectiveness of manual, mechanical and biological controls on certain species is ineffective and they continue to spread at alarming rates.

H. Conformance With Land Use Plans, Policies, and Programs

- Federal Land Policy Act of 1976, Public Rangelands Improvement Act (PRIA), October 1978, Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974).

This EA is tiered to the Northwest Area Noxious Weed Control Program Environmental Impact Statement (EIS) as Supplemented (March 1987) and the Vegetation Treatment on BLM Lands in Thirteen Western States EIS (1991).

This EA is in compliance with management direction established in the Salem District Resource Management Plan (RMP - May, 1995).

Salem District Record of Decision and Resource Management Plan, May 1995, pp. 64 Resource Programs), 74 (Need for Further Analysis), Appendix J-17 (Monitoring), *ACS Objectives and Riparian Reserves*: Both alternatives will help restore diversity of plant communities by allowing and/or supplementing by planting native vegetation in riparian areas and wetlands.. The project meets Objective 8 of the ACS, which is to maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability. It also meets Objective 9, which is to maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

***Watershed Analysis and LSR Assessment*:** All of the Cascades Resource Area's watershed analyses have addressed exotic and introduced species of concern and the need for the control and/or eradication.

EA Consultation: Pursuant to Section 7 of the Endangered Species Act, these projects will be consulted on with the United States Fish and Wildlife Service under the FY2003 Programmatic Habitat Modification and Disturbance Only Biological Opinions. The disturbance acres allowed for the resource area for invasive plant control for FY2002-2003 is 600 acres (light disturbance: 200 unprotected, 100 protected and heavy disturbance: 300 protected). Removal methods include sprayers. Activities near spotted owl sites are seasonally restricted.

Consultation with the National Oceanic Agency(NOAA) for the non-herbicide treatments was completed under the Programmatic Biological Opinions for the Upper Willamette river and Lower Columbia River Evolutionarily Significant Units. Consultation with NOAA Fisheries for herbicide treatments is in progress. Additionally, the project would incorporate any additional design features required as a result of the Terms and Conditions contained within the corresponding Biological Opinion.

In addition, this proposed action is subject to the following land use laws and/or acts: Federal Policy and Management Act (FLPMA), October 1976, Public Rangelands Improvement Act (PRIA), October 1978, Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974.

Documents providing additional direction include:

- ❏ *(RMP/FEIS) Salem District Proposed Resource Management Plan/Final Environmental Impact Statement,* September 1994.

- ❏ *(SEIS/ROD) Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl,* April 1994. The RMP was designed to be consistent with the *SEIS/ROD* and incorporated the analysis in the *SEIS* (RMP p.3).

- ❏ *(SEIS) Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl,* February 1994.

- ❏ *(FEMAT) Forest Ecosystem Management: An Ecological, Economic, and Social Assessment: Report of the Forest Ecosystem Management Assessment Team,* July 1993.

- ❏ *(SM/ROD) Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines,* January, 2001.

- ❏ *(SM/FEIS) Final Supplemental Environmental Impact Statement for Survey and Manage, Protection Buffers, and Other Mitigation Measures in the Northwest Forest Plan*, November 2000.

- ❏ *(IM OR-2002-064*) *2001 Survey and Manage Annual Species Review,* June 2002.

VI. References

Asher, Jerry E. and David W. Harmon. 1995. Invasive exotic plants are destroying the naturalness of UlS. Wilderness area. International Journal of Wilderness 1(2):35-37.

Bedunah, D. J. 1992. The complex ecology of weeds, grazing and wildlife. Western Wildlands. 18:6-11.

Blackburn, W., R. W. Knight, & J.L. Schuster. 1982. Saltcedar influence on Sedimentation in the Brazos River. J. Soil Water Cons. 37:298-230.

California Department of Food and Agriculture Encycloweedia, http://pi.cdfa.ca.gov/weedinfo/

Chambers, K.L. 1966. Notes on some grasses of the Pacific Coast. Madrono 18: 250-251.

Creating an Integrated Weed Management Plan: A Handbook for Owners and Managers of Lands with Natural Values, Caring for the Land Series; Vol IV; March 2000; Colorado natural Areas Program, Colorado State Parks, Colorado Department of Natural Resources, and Division of Plant Industry of the Colorado Department of Agriculture

Franklin, J. F. and C. T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. Pacific Northwest Forest and Range Experiment Station. U.S. Dept. of Agriculture, Forest Service, Portland, Or.

Harris, P. 1991. Invitation paper (C.P. Alexander Ford): Classical biocontrol of weeds: Its definition, selection of effective agents, and administrative-political problems. Can. Entomol. 125: 822-849.

Integrated Pest Management Information Service, IPM Practitioners Association; Noxious Weed Integrated Vegetation Management Guide, http://www.efn.org/~ipmpa/

Invaders Database System, University of Montana, http://invader.dbs.umt.edu/

Ivy Removal Project (No Ivy League), http://www.noivyleague.com

Kaye, T. 2001. *Brachypodium sylvaticum* (Poaceae) in the Pacific Northwest. Botanical Electronic News No. 277, 29 Nov 2001. (www.ou.edu/cas/botany_micro/ben/ben277.html)

Lacey, C., J. R. Lacey, P. K. Fay, J. M. Story, and D. L. Zamora. 1995. Controlling Knapweed on Montana rangeland. Montana State Univ. Coop. Ext. Circ. 311. p. 17.

National Oceanic and Atmospheric Administration. 2002. Pesticides and Pacific salmon: Technical guidance for NOAA Fisheries section 7 pesticide consultations (draft). Environmental Conservation Division. Seattle, WA.

National Strategy for Invasive Plant Management. More information at http://bluegoose.arw.r9.fws.gov/ficmnewfiles/NatlweedStrategytoc.html

Nyvall, R,. 1995. Fungi associated with purple loosestrife in Minnesota. Mycologia. 87:501-6.

Rawinski, T. J. and Richard A. Malecki. 1984. Ecological relationships among purple loosestrife, cattail and wildlife ant the Montezuma National Wildlife Refuge. New York Fish and Game Journal 31:81-87.

Sheley, Roger L. and Janet K. Petroff, eds. Biology and Management of Noxious Rangeland Weeds. Corvallis: Oregon State University Press. 1999.

Soll, Jonathan. 2001. Sandy River Riparian Habitat Protection Project. Final Report BLM-TNC Challenge Cost Share. Phase 1

Strategies for the Management and Control of Invasive Plant Species on Eugene and Salem BLM Districts (draft, June 2002).

Strefeler, M., E. Darmo, R. Becker, E. Katovich, 1996. Isozyme characterization of genetic diversity in Minnesota populations of purple loosestrife. Amer. J. of Bot. 83:265-273. Test, P. 1993. Economic value of the grant county weed program to livestock production. An economic analysis. Grant County, Oregon.

USDA. 1996. Upper Sandy Watershed Analysis. Mt. Hood National Forest. Sandy, OR

USDA USFS, USDI BLM. 1998. North Willamette LSR Assessment. Mt. Hood National Forest, Sandy, OR & Cascade Resource Area, Salem BLM, Salem, OR.

USDA . 1999. Willamette National Forest Integrated Weed management Environmental Assessment. Eugene, OR.

USDI BLM. 1987. Supplement to the Northwest Area Noxious Weed Control Program final environmental impact statement. Oregon State Office. Portland, OR.

USDI BLM. 1989. Western Oregon Program-Management of Competing Vegetation: Final record of decision. Oregon State Office. Portland, OR.

USDI BLM 1991. Bureau of Land Management Final environmental impact statement: Vegetation Treatment on BLM Lands in 13 Western States. BLM-WY-EIS-91-022-4320. Cheyenne, WY.

USDI BLM. 1994. Noxious Weed Strategy for Oregon/Washington. Oregon State Office. Portland, OR.

USDI BLM. 1996. Partners Against Weeds: An Action Plan for the Bureau of Land Management. Billings, MT.

USDI BLM 1999. Molalla River Watershed Analysis. Salem, OR

USDI BLM. 1985. Northwest Area Noxious Weed Control Program. EIS. Oregon State Office.

USDI BLM 1995. Salem District Resource Management Plan. Salem District, Salem, OR.

USDI. 1992. Sandy Wild and Scenic River and State Scenic Waterway Management Plan Environmental Assessment. Salem District BLM.

USDI, BLM. 2000. Strategic Plan, Bureau of Land Management. Washington, D.C.

USDI. 1995. Watershed Analysis for Hamilton Creek. Salem District BLM.

Vitousek, P. M. 1986. Biological invasions and ecosystem properties: can species make a difference? Pp. 163-1763. In H. A. Mooney and J. A. Drake eds. Ecology of Biological Invasions of North America and Hawaii. Springer-Verlag, New York.

Washington State Noxious Weed Control Board, http://www.wa.gov/agr/weedboard

Weeds Gone Wild: Alien Plant Invaders of Natural Areas, Plant Conservation Alliance's Alien Plant Working Group, http://www.nps.gov/plants/alien/

Weeds on the Web, The Nature Conservancy and UC-Davis, http://tncweeds.ucdavis.edu/

APPENDIX A: TREATMENT LIST

Species	Location	Land use Allocation	# of plants/acres	Treatment Method
Spotted knapweed	T7S, R3E, Sec 22	LSR	1 ac.	Manual/Herbicide/ blocking of turnout
	T2S,R6E, Sec. 16	Mt. Hood Corridor		Manual and/or herbicide
	T11S,R1E, Sec 23			Manual and/or herbicide
	Unknown	All		Manual and/or herbicide
Japanese knotweed	Sandy River & tributaries	ACEC, Proposed ACEC		Manual and herbicide
	Sandy River - New acquisitions	Proposed ACEC		Manual and Herbicide
	Crabtree Creek	GFMA	1 ac.	Manual and Herbicide
	Hillockburn	GFMA	1 ac.	Manual and/or herbicide
	Unknown – new locations			Manual and/or herbicide
English ivy	Wilhoit Springs	ACEC	1 ac	Manual Cutting and Grubbing
	Sandy River – New acquisitions	Proposed ACEC	3 ac.	Manual cutting and grubbing
	North Santiam ACEC	ACEC	1 ac.	Manual cutting and grubbing
	6S,2E, Sec.7	GFMA	.5ac	Manual cutting and grubbing
Scotch broom (biocontrols released by ODA)	North Santiam ACEC		4 ac.	Manual
	Sandy River (partially covered by Minsinger Bench reforestation EA OR080-02-01)	ACEC, new acquisitions	1 to 100 acres	Manual and burning
	Mollala River	GFMA	200 ac.	Manual
	Quartzville	LSR, GFMA, wild and scenic River	25 miles along roadsides	Manual
	6S 2E Sec 33	GFMA	10 acres (2 sites)	Manual

Blackberry	Sandy River	Proposed ACEC	25 acres	Manual cutting, grubbing, hot stream treatments, burning
	Mollala river	Recreation camping sites	20 acres	Manual cutting, grubbing, hot steam treatments
	11S-1E, Sec 5	Proposed thinning area	80 acres	Manual cutting, other possible treatments.
Blackberry and Scotch broom	6S 2E Sec 29	GFMA proposed thinning treatment	1 mile along road	Manual cutting, grubbing, hot steam treatments
	6S 2E Sec 4, 9	GFMA proposed thinning treatment area	30 acres	Manual cutting, grubbing, hot steam treatments
False Brome	Unknown	All		Depending on the size of infestation and location, plus new info on best treatments
New species	Unknown at this time			

New species and new sites will be added to the list and prioritized for treatments by the ID team based on the Priorities for Treatment (page 5), location (accessibility and land use allocation), and funding.

APPENDIX B: ENVIRONMENTAL ELEMENTS

This table summarizes Environmental Elements that have been considered in developing the Alternatives, and identifies elements affected by the project and where the effects are described in the text. * Environmental features which the Bureau of Land Management is required by law or policy to consider in all Environmental Documentation (BLM Handbook H-1790-1, Appendix 5: Critical Elements of the Human Environment)

Environmental Element		Effect		Section Addressed In Text or Comments
		Yes	No	
* Air Quality		X		Air quality impacts would be of short duration during burning. Burning would temporarily reduce air quality until the gases and particulates that make up smoke are dissipated.
* Areas of Critical Environmental Concern		X		See Special Management Areas **on page 5**
* Cultural, Historic, Paleontological Resources			X	Cultural resource inventories of the affected area would precede management actions that could damage cultural resources or impact culturally significant plants (see Mitigation Measures on page 5 #4). Treatment of invasive non-native plants would maintain and enhance traditional (American Indian) plant collection areas over the long term.
* Environmental Justice			X	N/A, No Effect
* Prime or Unique Farm Lands			X	N/A, No Effect
* Flood Plain		X		Treatment of knotweeds along rivers should be beneficial to floodplains
* Native American Religious Concerns			X	N/A, No Effect
* Threatened or Endangered Species	Plants	X		See pages 6, 9, and 18
	Animals	X		No effect/may effect, Not likely to adversely affect. See pages 6, 14, and 19
Special Status Plant Species		X		See pages 9
Special Status Animal Species		X		See pages 24, 30
* Hazardous / Solid Waste		X		No hazardous waste sites have been identified on the CRA. Herbicides are considered a hazardous material. No unacceptable impacts are anticipated by following the label for application and disposal.
* Water Quality (Surface and Ground)		X		See pages 5, 8, and 17
Fisheries Resources		X		See pages 5, 15, and 19
* Wetlands / Riparian Zones		X		See pages 5 and 8
* Wild and Scenic Rivers		X		See page 5

Environmental Element	Effect		Section Addressed In Text or Comments
	Yes	No	
* Wilderness		X	N/A, No Effect
* Invasive, Non-native species	X		Document
Adjacent Land Uses		X	N/A, No Effect
Mineral Resources		X	N/A, No Effect
Recreation/Visual Resources	X		See pages 6, 15, 20
Socioeconomic Resources	X		Effects of herbicides on humans can also be found in Chapter 9 of Oregon Pesticide Applicators Manual (OPAM) and in the Material Safety Data Sheets. The greatest health risk is to workers applying the herbicides. To ensure pesticides are applied safely and effectively, anyone handling and applying herbicides on public land within the CRA would be certified and licensed by the ODA or the U.S. Department of Interior in the proper methods of handling and applying herbicides. By following the manufacturer's label and procedures in OPAM, no unacceptable effects to humans are anticipated (also see Mitigation Measures, page 5, #2).
Soil Resources	X		See pages 8, 17
Vegetation Resources	X		See pages 9, 18
Wildlife Resources	X		See pages 14, 19
Fuels Management		X	N/A, No Effect

Downstream Beneficial Uses Review Summary (Salem FEIS 3-9)		
Downstream Beneficial Uses	**Affected/ Not Affected/ N/A (not present within the project area)**	**Remarks /References**
Public Water Supply	Affected	Covered in text - page 17
Private Domestic Water Supply	Affected	Covered in text - page 17
Irrigation	Not affected	
Fisheries	Affected	Covered in text - page 19
Wildlife	Affected	Covered in text - page 19
Recreation	Affected	Covered in text - page 20
Maintenance of Aesthetic Quality	Affected	Covered in text - page 21

APPENDIX C: AQUATIC CONSERVATION STRATEGY OBJECTIVES

The Salem District Record of Decision and Resource Management Plan (RMP, Sept 1995), calls for the attainment of the Aquatic Conservation Strategy (ACS) objectives. Each objective and the relationship to the proposed action are discussed below. This section will address the effects of implementing the alternatives, described in this document, in relation to each of the ACS Objectives. Forest Service and BLM-administered lands within the range of the spotted owl will be managed to:

Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Project Discussion: The removal and/or control of invasive non-native plant species under Alternative A would help ensure that the lands are managed in compliance with the ACS objectives. The riparian and wetland habitat on the lands would be protected from invasive species, which would encourage a diversity of native species. This would contribute toward maintaining the complexity of aquatic systems. Removal and/or control of certain invasive non-native plants may not be accomplished under Alternative B.

Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Project Discussion: The integrated weed management program as outlined in Alternative A would begin to restore some of the wetlands, floodplains and uplands. Species such as Japanese knotweed can quickly take over riparian sites and crowd out native species destroying any connecting habitats. By controlling species connecting habitats are restored and managed under ACS objectives. Species such as the knotweed may not be controlled without the use of herbicides under Alternative B.

Objective 3: Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Project Discussion: Most invasive species are not known for their soil stabilizing ability nor do they provide the habitat needed for floodplains. Native species that have adapted over the years to the streams and river ecology would most likely provide greater protection to the shoreline and banks. Under Alternative A species such as the Japanese knotweed which can easily establish on floodplains on the Sandy River are more likely to be controlled with the use of herbicides. Alternative B does not have the option of herbicide use, so control is not likely to be successful.

Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and the benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Project Discussion: As discussed above, the integrated invasive species management would increase the amount of native riparian and wetland habitats managed for ACS objectives and contribute toward meeting this objective especially with restoration efforts on the disturbed lands. Alternative A has more options for meeting this objective than Alternative B.

Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of sediment regime include timing, volume, rate, and character of sediment input, storage and transport.

Project Discussion: Changes in the sediment regime could occur if invasive species such as knotweed were allowed to become the dominant species. By controlling or eradicating non-native species, native species, which have adapted to high and low water flows are more likely to maintain and restore the sediment regime. The Nature Conservancy has found that applying herbicide to the cut end of Japanese knotweed is the most effective way of controlling and eradicating this species. This would only be an option under Alternative A and not Alternative B.

Objective 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Project Discussion: An integrated invasive species management program would work to maintain and restore natural in-stream flows by providing native vegetation along riparian areas, which have adapted to high and low flow regimes. Alternative A has more options for controlling species than Alternative B.

Objective 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Project Discussion: Any floodplains and meadows which have invasive weed species should be prioritized for management since inundation could help spread invasive species downstream. The proposed management action should help maintain and restore this objective. Use of herbicides under Alternative A will help restore native vegetation on floodplains being invaded by knotweed. Control will be less likely under Alternative B.

Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Project Discussion: Integrated invasive species management will help restore diversity of plant communities by allowing native species to repopulate sites. Native species are adapted to the conditions and ecological processes in riparian areas and wetlands. See Objective 7 above.

Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Project Discussion: Invasive weed species tend to create monocultures and crowd out the native species. Using an integrated approach and eradicating some of the most invasive non-native plant species can accomplish a more effective and successful restoration effort. Alternative A allows for the use of herbicide which when applied according the directions and directly on the target species has been shown to effectively control species such as knotweed which can create monocultures. Alternative B does not include that option and the knotweeds may not be controlled.

APPENDIX D: GLOSSARY

ACS - See "Aquatic Conservation Strategy"

Aquatic Conservation Strategy - The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and the Bureau of Land Management within the range of Pacific anadromy. The Aquatic Conservation Strategy is designed to meet nine objectives. Compliance with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore biological and physical processes within their ranges of natural variability.

EA - See "Environmental Assessment"

Environmental Analysis - A systematic process of developing reasonable alternatives and predicting the probable environmental Effects of a proposed action and the alternatives.

Environmental Assessment - A systematic analysis of site-specific activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required (RMP Chapter 6-4); a concise public document required by the regulations for implementing the procedural requirements of the National Environmental Policy Act (40 CFR 1508.9).

Environmental Impact Statement - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action; a detailed written statement as required by section 102(2)(C) of the [National Environmental Policy] Act, as amended (40 CFR 1508.11).

Finding of No Significant Impact - A document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (40 CFR 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared (40 CFR 1508.13).

IDT - See "Interdisciplinary Team"

Interdisciplinary Team - A group of environmental experts who conduct the environmental analysis.

Major Issue - Also referred to as "significant issue." A major point of discussion, debate, or dispute about the environmental effects of the proposed action. For the purposes of the National Environmental Policy Act, a major issue or significant issue is an issue within the scope of a proposed action, which is used to formulate alternatives, develop mitigation measures, or is important in tracking effects.

National Environmental Policy Act - The basic national charter for the protection of the environment. It establishes policy, sets goals (section 101), and provides means (Section 102) for carrying out the policy.

NEPA - See "National Environmental Policy Act"
Non-target Plants – Treatments are not directed at these plants, although they may be affected because of their location.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

RR - See “Riparian Reserve”

Scoping - An ongoing process to determine the breadth and depth of an environmental analysis.

Target Plants – Treatments are directed at these specific plants to control or eradicate.

APPENDIX E: TREATMENT DESCRIPTIONS

This list is taken from the Partners Against Weeds – An action plan for the Bureau of Land Management (1996), Appendix 5 and the Noxious Weed Strategy for Oregon/Washington (1994), Appendix 4..

Cultural

- Develop available preventive measures, such as quarantine and closure, to reduce the spread of the infestation.
- If past management activities have allowed the introduction and spread of invasive non-native plants, determine how to change management after selecting a treatment method.
- Determine whether livestock or wildlife feeding programs can be managed to reduce weed infestations.
- Determine feasibility of changes in wildlife movement that would reduce or contain the infestation due to movement of seeds on or in the animals.
- Revegetate all bare soil following disturbance.
- Only allow weed-free equipment in an uninfested area: e. g., logging, mining, recreation.
- Limit, restrict, or modify recreational uses such as ORV's, bicycling, rafting, and hiking to reduce spreading weeds. In some cases, recreational sites may have to be quarantined.
- Determine if changes of season and type of recreational use are necessary to reduce or contain the spread of noxious weeds.
- Select plant species that would reduce the spread of noxious weeds.
- Defer soil disturbance if possible until weeds are controlled or under management.
- Develop rock source management plans.
- Keep utilization of rock source confined to existing contaminated roads.
- Keep new or "clean" rock stockpiles separate from contaminated stockpiles.
- Obtain rock from uncontaminated sources.
- Determine most feasible land use to reduce and prevent infestations.
- Determine whether or not specific public awareness programs could reduce the infestation or control the spread of weeds.
- Determine if exclusion of various uses is a possibility and if it would reduce weed spread.

Physical Control

- Determine whether or not hoeing or "grubbing" would reduce (or increase) the infestation.
- Determine if hand pulling the weeds reduces the seed source.
- Evaluate terrain to allow for mowing and determine whether or not it is an acceptable option for control of the spread of seeds.
- Evaluate cultivation and other conventional farming practices options that could be utilized cost effectively.
- Determine whether or not policy and laws allow controlled burning and address regulations regarding smoke management.
- Determine whether or not the terrain and vegetative cover allow for a controlled burn program.
- Evaluate whether a controlled burning program will reduce the infestation without long-term deleterious effects upon desirable native vegetation.
- Monitor heavy recreational use sites seasonally for early detection of new weeds. Mark and hand-pull when found, especially before seed ripe.

Biological Control

- Determine whether or not there are naturally occurring agents within the ecosystem which can reduce the infestation.
- Determine which elements affect natural occurring control agents.
- Determine whether or not these elements can be modified to reduce the negative effect on these agents.
- Determine whether or not these elements can be enhanced to increase the effectiveness of these agents on the non-native infestation.
- Determine whether or not biological control agents can be introduced into the ecosystem and survive to reduce the amount of infestation.
- Determine which introduced biological agents provide an acceptable control method for this infestation.
- Evaluate if the biological control agent has been tested for adverse affects against all nontarget species within the treatment area.
- Determine whether or not policy and laws allow for the introduction of biological control agents.
- Determine whether policy and lows allow for introduction and grazing of livestock as a biological control measure.

Biological control, including the use of domestic animals, is a proven method of successfully controlling some species of invasive weeds. The introduction of weed selective insects, known as classical biocontrol, has provided economical and sustainable control of St. Johnswort, tansy ragwort, and musk thistle in a majority of infested areas. Sheep and goats have controlled leafy spurge in several Wilderness Management Areas. Insects released against leafy spurge within the last 8 years are significantly reducing weed populations in several locations; the most promising insects have not been redistributed to thousands of locations.

Although biocontrol research is continuing on insects and plant pathogens for leafy spurge, knapweeds, and a few other weeds, the overall effort is severely limited in scope.

Thus, the promise of biocontrol should never be used as an excuse to postpone other Integrated weed management activities for prevention, containment, or control of weed invasions. Classical biological control is not appropriate for small spot infestations, for sites where rapid control is desired, or where other management practices are preferred for weed control of might be damaging to the agents.

Chemical Control

- Determine whether or not chemical fertilization would reduce the amount of invasive non-natives by increasing competition of beneficial plant species.
- Evaluate the acceptability of herbicides to control the infestation.
- Determine whether or not herbicides are labeled for:

  - ✓ Use on the target weed.
  - ✓ Use on the infested site (consider non-target plants, soil type, groundwater location, topography, climate, State labeling, etc.).
  - ✓ Determine the most effective application techniques.

- Determine the most effective and cost-efficient types of conventional application equipment.
- Determine whether or not properly trained personnel are available to apply the herbicide.

APPENDIX F: INTERDISCIPLINARY TEAM MEMBERS

Resource	Name	Initial	Date
Cultural Resources	Fran Philipek	CDB	2/7/03
Soils	John Caruso	JRC	2/6/03
Hydrology/Water Quality/Soils	Patrick Hawe	PH	1/28/03
Wildife T&E	Jim S. England	JSE	2/3/03
Wildlife/Restoration	Jim Irving	JI	2/7/03
Aquatics/Fisheries	Dave Roberts	DR	1/29/03
Recreation/Visual Resource Rural Interface/Wild and Scenic Rivers	Laura Graves	LG	2/7/03
NEPA Coordinator	Carolyn Sands	CB	2/7/03
Botany	Claire Hibler	CH	2/3/03
Ecology/Team Lead	Barbara Raible	BR	2/5/03

APPENDIX G: Herbicides Approved for Use for Invasive Non-Native Plant Control on BLM Managed Lands in Oregon

The following herbicides were approved for use for invasive non-native plant control on BLM managed lands in Oregon in the Northwest Area Noxious Weed Control Program EIS (December 1985), supplement to the Northwest Area Noxious Weed Control Program Final Environmental Impact Statement (March 1987) and Western Oregon Program-Management of Competing Vegetation (Final Record of Decision, August 1992):

2,4-D

dicamba

dicamba + 2,4-D

glyphosate

glyphosate + 2,4-D

picloram

picloram + 2,4-D

The following pages are summarized version of the worksheets covering uses and effects. Pesticide Fact Sheets were prepared for the U.S. Department of Agriculture, Forest Service by Information Ventures, Inc. The complete sheets can be found at http://infoventures.com/e-hlth/pestcide/pest-fac.html.

Summary of Basic Information for 2,4-D

Common name: 2,4-D **Chemical name:** 2,4-Dichlorophenoxyacetic acid

Common Product names: Hi-Dep®, Weedar® 64, Weed RHAP A-4D®, Weed RHAP A

Pesticide classification: herbicide and plant growth regulator

Registered Use Status: General Use

I. Herbicide Uses

Registered forestry, rangeland, right-of-way uses: conifer release, noxious and poisonous weed control, range improvement, right-of-way maintenance, site preparation, aquatic weed control, general weed control, thinning, timber management, wildlife habitat improvement, range management, research and engineering, recreation management, fire-break management, and nursery stand improvement.

2,4-D is used to control broadleaf weeds, grasses and other monocots, woody plants, aquatic weeds, and non-flowering plants. It is a plant-growth regulator that stimulates nucleic acid and protein synthesis and affects enzyme activity, respiration, and cell division. It is absorbed by plant leaves, stems, and roots and moves throughout the plant. It accumulates in growing tips.

Methods of application: aerial and ground spraying, lawn spreaders, cut surface treatments, foliar spray, basal bark spray, and injection.

II. Environmental Effects/Fate

Soil: 2,4-D may remain active for one to six weeks in the soil. Over time, 2,4-D will bind to organic matter in soil. Soil high in organic matter will bind 2,4-D the most readily. 2,4-D is not persistent in soil. At its highest application rate it persists for 30 days in soil. 2,4-D is rapidly degraded in soil, especially by soil microorganisms. It degrades more rapidly under warm, moist conditions. It is also taken up from the soil by target plants. Some forms of 2,4-D will evaporate from the soil. 2,4-D will degrade to half of its original concentration in several days. In soil, 2,4-D may be metabolized by microbes in steps to 2,4-dichlorophenol and 4-chlorophenol and then ultimately to harmless forms.

Water: The 2,4-D acid form, the oil-soluble amine salt and low-volatile ester do not dissolve well in water. Other amine salts dissolve very well in water. 2,4-D has only limited potential to contaminate ground-water. 2,4-D ranges from being mobile to highly mobile in sand, silt, loam, clay loam, and sandy loam. However, it is unlikely to be a ground-water contaminant due to the rapid degradation of 2,4-D in most soils and rapid uptake by plants. Most reported 2,4-D ground-water contamination has been associated with spills or other large sources of 2,4-D release. Maximum concentrations of 2,4-D applied to surface water are reached in one day. 2,4-D residues dissipate rapidly, especially in moving water. 2,4-D residues may be detected in still water after 6 months. Do not apply 2,4-D directly to water or wet-lands such as swamps, bogs, marshes, and potholes except as specified for certain aquatic uses. Do not contaminate water when disposing of equipment wash waters.

Air: The tendency of 2,4-D to evaporate is dependent on the chemical form used. Forms with the least tendency to evaporate include the acid, inorganic salt, amines and long chain esters; the oil-

soluble amines are least volatile. These forms may be used near desirable vegetation if spray drift is prevented. Other ester formulations evaporate readily and should not be used near desirable vegetation. The burning of vegetation treated with 2,4-D has not generated detectable 2,4-D byproducts in the field.

III. Ecological Effects

Non-Target Toxicity: 2,4-D has no effect on microorganisms at recommended field application rates. At higher levels, 2,4-D suppresses soil fungi and nitrogen-fixing algae. 2,4-D is highly toxic to many nontarget plants. 2,4-D forms range from being practically nontoxic to highly toxic to fish and aquatic invertebrates. 2,4-D amine salt forms are generally non-toxic to fish. Those compounds most toxic to fish include the 2,4-D ester formulations, N-oleyl-1,3-propylenediamine salt, and the N,N-dimethyl-oleyl-linoleylamine. Those 2,4-D compounds that are most toxic to invertebrates are the ester and dimethyl amine formulations.

Terrestrial Animals: 2,4-D forms range from being practically nontoxic to moderately toxic to birds. The 2,4-D butyl ester is practically nontoxic to birds on both a short and long term basis. 2,4-D is relatively nontoxic to honey bees. The ester formulations are the least toxic to insects. Mammals have moderate sensitivity to 2,4-D exposure.

Threatened And Endangered Species: Improper use of 2,4-D may kill or damage sensitive plant species. Animals may be affected by the loss of this vegetation. 2,4-D may be a hazard to endangered species if it is applied to areas where they live.

IV. Human Health Effects

Nervous system damage has resulted from absorption of 2,4-D through the skin. This damage to the nerves may be irreversible. Prolonged inhalation may cause dizziness, burning in chest or coughing. Large doses of 2,4-D have caused digestive distress and effects on the neuromuscular system. Ingestion of large quantities of 2,4-D formulations has led to death within 1 to 2 days of poisoning. Poisoning by lower doses of 2,4-D has led to symptoms, such as neuromuscular problems, that lasted for several months after ingestion. Existing medical conditions such as asthma or skin lesions may be aggravated.

Long-term exposure to 2,4-D has been reported to cause liver, kidney, digestive, muscular, or nervous system damage. Symptoms may include weakness, fatigue, headache, dizziness, loss of appetite, nausea, eye and nasal irritation, skin irritation, hypertension, and slowed heart rate.

Summary of Basic Information for Dicamba

Common name: Dicamba **Chemical name:** 3,6-dichloro-2-methoxybenzoic acid

Common Product names: Banvel®, Banex®, Trooper®

Pesticide classification: herbicide

Registered Use Status: "General Use"

I. Herbicide Uses

Registered forestry, rangeland, right-of-way uses: control of annual and perennial broadleaf weeds, brush, and vines in rangeland and non-cropland areas

Dicamba is used to control broadleaf weeds, brush and vines. It is absorbed by leaves and roots, and moves throughout the plant. In some plants, it may accumulate in the tips of leaves. Dicamba acts as a growth regulator. Some plants can metabolize or break down dicamba.

Method of application: ground or aerial broadcast, band treatment, basal bark treatment, cut surface treatment, spot treatment or wiper

II. Environmental Effects/Fate

Soil: Dicamba is active in the soil. It is not adsorbed by most soils. It is highly mobile in most soils. Dicamba is moderately persistent in soil. It has a half-life of 1 to 6 weeks in soil. Dicamba is broken down by soil microorganisms. The break-down is slower at low temperatures and with low soil moisture. Dicamba breaks down faster in organic soils than in clay or sand. The main metabolite or break-down product of dicamba in soil is 3,6-dichlorosalicylic acid.

Water: Dicamba is slightly soluble in water. Dicamba can leach into ground-water. Dicamba has been found in ground-water and surface water. Keep dicamba out of lakes, streams, ponds, irrigation ditches and domestic water.

Air: Dicamba is relatively volatile. It can evaporate from leaf surfaces, and may evaporate from the soil. No information is available on the potential for by-products from burning of treated vegetation.

III. Ecological Effects

Non-Target Toxicity: Dicamba is almost non-toxic to microorganisms. Dicamba is toxic to many broadleaf plants and to conifers. It does not injure most grasses. Dicamba is slightly toxic to fish and amphibians. It is practically non-toxic to aquatic invertebrates. Dicamba does not accumulate or build up in aquatic animals. Dicamba and its formulations have not been tested for chronic effects in aquatic animals.

Terrestrial Animals: Dicamba and its formulations are slightly toxic to mammals. Dicamba and its formulations are practically non-toxic to birds. Dicamba is not toxic to bees. It does not

accumulate or build up in animals. Dicamba and its formulations have not been tested for chronic effects in terrestrial animals.

Threatened And Endangered Species: Use patterns of dicamba do not present any problem to endangered species.

IV. Human Health Effects

Effects of exposures to dicamba included muscle cramps, difficult breathing, nausea, vomiting, skin rashes, loss of voice, swollen neck glands, coughing and dizziness. There are no reported cases of long term health effects in humans due to dicamba or its formulations.

Potential for adverse health effects from contacting or consuming treated vegetation, water or animals: The exposure levels a person could receive from these sources, as a result of routine operations, are below levels shown to cause harmful effects in laboratory studies.

Summary of Basic Information for Glyphosate

Common name: Glyphosate **Chemical name:** N-(phosphonomethyl)glycine

Common Product names: Roundup®, Rodeo®, Accord®

Pesticide classification: herbicide

Registered Use Status: "General Use"

I. Herbicide Uses

Registered forestry, rangeland, right-of-way uses: planting site preparation, conifer release, forest nurseries, rights-of-way and facilities maintenance, and invasive non-native plant control.

Target Plants: Glyphosate is used to control grasses, herbaceous plants including deep rooted perennial weeds, brush, some broadleaf trees and shrubs, and some conifers. Glyphosate does not control all broadleaf woody plants. Timing is critical for effectiveness on some broadleaf woody plants and conifers.

Glyphosate applied to foliage is absorbed by leaves and rapidly moves through the plant. It acts by preventing the plant from producing an essential amino acid. This reduces the production of protein in the plant, and inhibits plant growth. Glyphosate is metabolized or broken down by some plants, while other plants do not break it down. Aminomethylphosphonic acid is the main break-down product of glyphosate in plants.

Method of application: aerial spraying; spraying from a truck, backpack or hand-held sprayer.

II. Environmental Effects/Fate

Soil: Glyphosate is not generally active in the soil. It is not usually absorbed from the soil by plants. Glyphosate and the surfactant used in Roundup are both strongly adsorbed by the soil. Glyphosate remains unchanged in the soil for varying lengths of time, depending on soil texture and organic matter content. The half-life of glyphosate can range from 3 to 130 days. Soil microorganisms break down glyphosate. In tests, the surfactant in Roundup has a soil half-life of less than 1 week. Soil microorganisms break down the surfactant. The main break-down product of glyphosate in the soil is aminomethylphosphonic acid, which is broken down further by soil microorganisms. The main break-down product of the surfactant used in Roundup is carbon dioxide.

Water: Glyphosate dissolves easily in water. The potential for leaching is low. Glyphosate and the surfactant in Roundup are strongly adsorbed to soil particles. Tests show that the half-life for glyphosate in water ranges from 35 to 63 days. The surfactant half-life ranges from 3 to 4 weeks. Studies examined glyphosate and aminomethylphosphonic acid (AMPA) residues in surface water after forest application in British Columbia with and without no-spray streamside zones. With a no-spray streamside zone, very low concentrations were sometimes found in water and sediment after the first heavy rain. Where glyphosate was sprayed over the stream, higher peak concentrations in water always occurred following heavy rain, up to 3 weeks after application.

Glyphosate and AMPA residues peaked later in stream sediments, where they persisted for over 1 year. These residues were not easily released back into the water.

Air: Glyphosate does not evaporate easily. Major products from burning treated vegetation include phosphorus pentoxide, acetonitrile, carbon dioxide and water. Phosphorus pentoxide forms phosphoric acid in the presence of water. None of these compounds is known to be a health threat at the levels which would be found in a vegetation fire.

III. Ecological Effects

Non-Target Toxicity: Glyphosate and the surfactant have no known effect on soil microorganisms. Contact with non-target plants may injure or kill plants. Glyphosate is no more than slightly toxic to fish, and practically non-toxic to aquatic invertebrate animals. It does not build up (bioaccumulate) in fish. The Accord and Rodeo formulations are practically non-toxic to freshwater fish and aquatic invertebrate animals. The Roundup formulation is moderately to slightly toxic to freshwater fish and aquatic invertebrate animals. Glyphosate and its formulations have not been tested for chronic effects in aquatic animals.

Terrestrial Animals: Glyphosate is practically non-toxic to birds and mammals. It is practically non-toxic to bees. Glyphosate and its formulations have not been tested for chronic effects in terrestrial animals.

Threatened And Endangered Species: Glyphosate may be a hazard to endangered species if it is applied to areas where they live.

IV. Human Health Effects

Most incidents reported in humans have involved skin or eye irritation in workers after exposure during mixing, loading or application of glyphosate formulations. Nausea and dizziness have also been reported after exposure. Swallowing the Roundup formulation caused mouth and throat irritation, pain in the abdomen, vomiting, low blood pressure, reduced urine output, and in some cases, death. These effects have only occurred when the concentrate was accidentally or intentionally swallowed, not as a result of the proper use of Roundup. The amount swallowed averaged about 100 milliliters (about half a cup). There are no reported cases of long term health effects in humans due to glyphosate or its formulations.

Summary of Basic Information for Picloram

Common name: Picloram **Chemical name:** 4-amino-3,5,6-trichloropicolinic acid

Common Product names: Tordon®, Grazon®, Access®, Pathway®

Pesticide classification: herbicide

Registered Use Status: All formulations that may be broadcast on soil or foliage are classified as "Restricted Use" pesticides. Sale and use of these pesticides are limited to licensed pesticide applicators or their employees, and only for uses covered by the applicator's certification. This is due to picloram's mobility in water, combined with the extreme sensitivity of many important crop plants to damage.

I. Herbicide Uses

Registered forestry, rangeland, right-of-way uses: Picloram is used to prevent regrowth of woody plants in rights-of-way, such as along roads and power lines. On rangelands, it is used to control invasive non-native plants and brush. In forestry, picloram is used to control unwanted trees and to prepare sites for planting trees. It is also used to control plants on non-crop industrial/facility sites.

Picloram is used to control broadleaf plants, brush, conifers and broadleaf trees.

Picloram is absorbed through plant roots, leaves and bark. It moves both up and down within the plant, and accumulates in new growth. It acts by interfering with the plant's ability to make proteins and nucleic acids. Picloram is metabolized or broken down by plants into carbon dioxide, oxalic acid, 4-amino-2,3,5-trichloropyridine and 4-amino-3,5-dichloro-6-hydroxypicolinic acid.

Method of application: broadcast or spot treatment as foliar (leaf) or soil spray; basal spot treatment; tree injection; frill treatment; stump treatment; basal bark treatment; low-volume dormant stem spray; by air as broadcast or low volume dormant spray

II. Environmental Effects/Fate

Soil: Picloram can stay active in soil for a moderately long time, depending on the type of soil, soil moisture and temperature. It may exist at levels toxic to plants for more than a year after application at normal rates. Picloram chemically attaches to clay particles and organic matter. If the soil has little clay or organic matter, picloram is easily moved by water. Long-term build-up of picloram in the soil generally does not occur. Break-down caused by sunlight and microorganisms in the soil are the main ways in which picloram disappears in the environment. Picloram will dissipate more quickly in warm, wet weather. Alkaline conditions, fine textured clay soils, and a low density of plant roots can increase the persistence of picloram. Carbon dioxide is the major end-product of the break-down of picloram in the soil. Carbon dioxide is a gas normally found in the air. The relatively small amount from picloram break-down would not be expected to have any harmful effect on the environment.

Water: Picloram dissolves readily in water. Picloram can leach into ground-water under certain soil and weather conditions. Picloram leaches more easily in soils which have low organic content or are very sandy. Picloram movement is greatest for soils with low organic matter content, alkaline soils, and soils which are highly permeable, sandy, or light-textured. Where the water table is very shallow, picloram may leach into ground-water. Picloram should not be applied to any surface which would allow direct pollution of ground-water.

Picloram can be carried by surface run-off water. To prevent water pollution, picloram spray drift or run-off should not be allowed to fall onto banks or bottoms of irrigation ditches, or water intended for drinking or household use. Picloram should not be applied directly to water or wetlands, such as swamps, bogs, marshes or potholes.

Air: Picloram does not evaporate easily. More than 95% of picloram residue is destroyed during burning. Although by-products from burning plants treated with picloram have been identified in the laboratory, they have not been identified in the field.

III. Ecological Effects

Non-Target Toxicity: Picloram has very low toxicity to soil microorganisms at up to 1,000 parts per million. Picloram is highly toxic to many non-target plants. Most grasses are resistant to picloram. Picloram is active in the soil and can pass from soil into growing plants. It can move from treated plants, through the roots, to nearby plants. Spray drift may kill plants some distance away from the area being treated. Irrigation water polluted with picloram may damage or kill crop plants. Picloram is moderately to slightly toxic to freshwater fish, and slightly toxic to aquatic invertebrate animals; it does not build up in fish. The formulated product is generally less toxic than picloram. Picloram and its formulations have not been tested for chronic effects in aquatic animals. Picloram is almost non-toxic to birds. It is relatively non-toxic to bees.

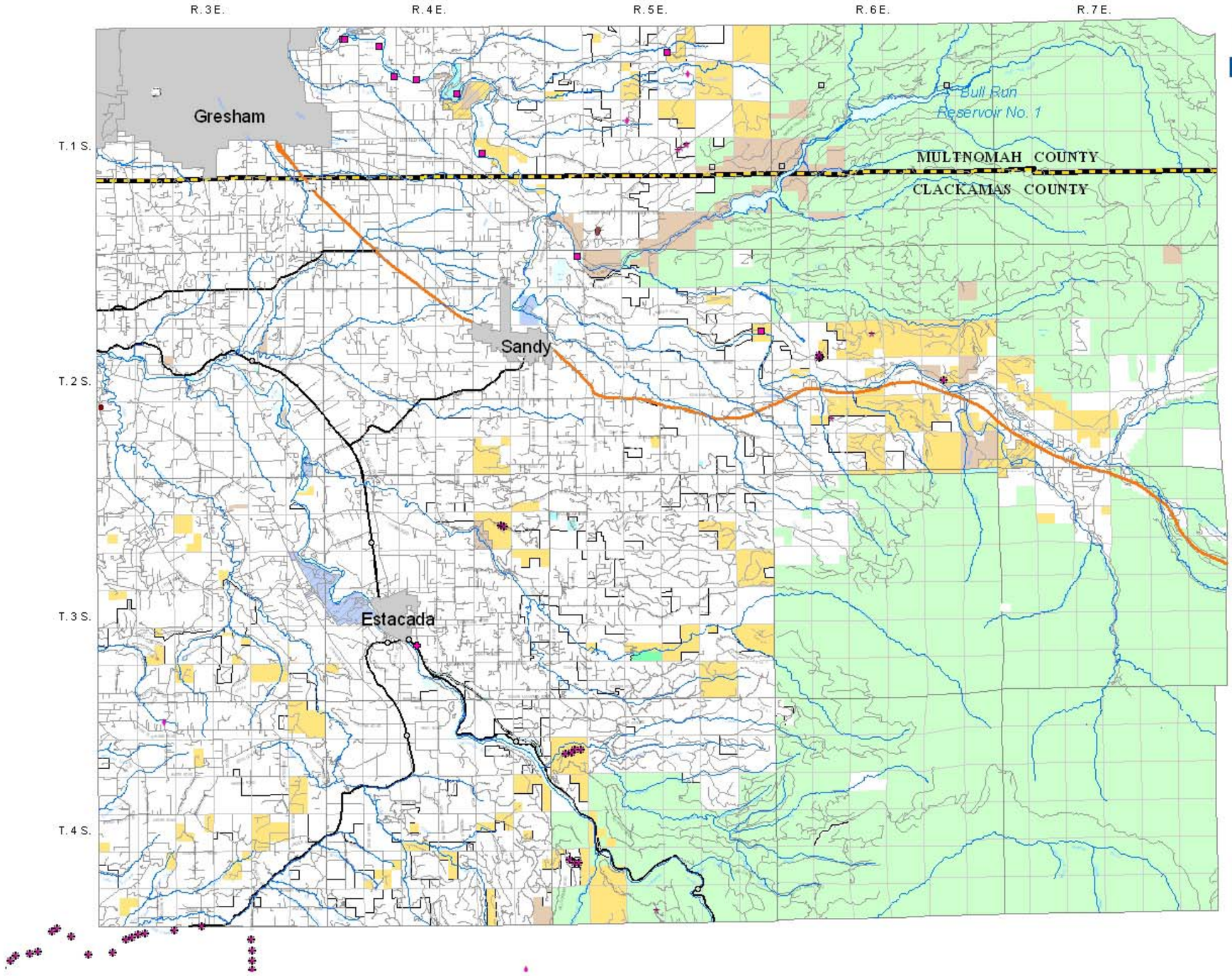
Terrestrial Animals: Picloram is low in toxicity to mammals; animals excrete most picloram in the urine, unchanged. The formulated product is generally less toxic than picloram. Picloram and its formulations have not been tested for chronic effects in terrestrial animals.

Threatened And Endangered Species: Picloram may be a hazard to endangered plants when used on pastures, rangeland and forests. Picloram may be a hazard to some endangered invertebrates if it is applied to areas where they live. It is not expected to be a hazard to other endangered animals or birds.

IV. Human Health Effects

Reported effects: A few cases of eye and skin irritation have been reported in workers exposed to picloram formulations. There are no reported cases of long term health effects in humans due to picloram or its formulations.

Cascades Resource Area
Invasive Non-Native Plants
EA Map 1- North



1:163,740

N

Legend

- Spotted knapweed
- Scotch broom
- Purple loosestrife
- Meadow knapweed
- Japanese knotweed
- Streams
- US Highway
- State Highway
- Other Roads
- Recreation Sites
- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Service
- Local Governments
- Other
- State of Oregon

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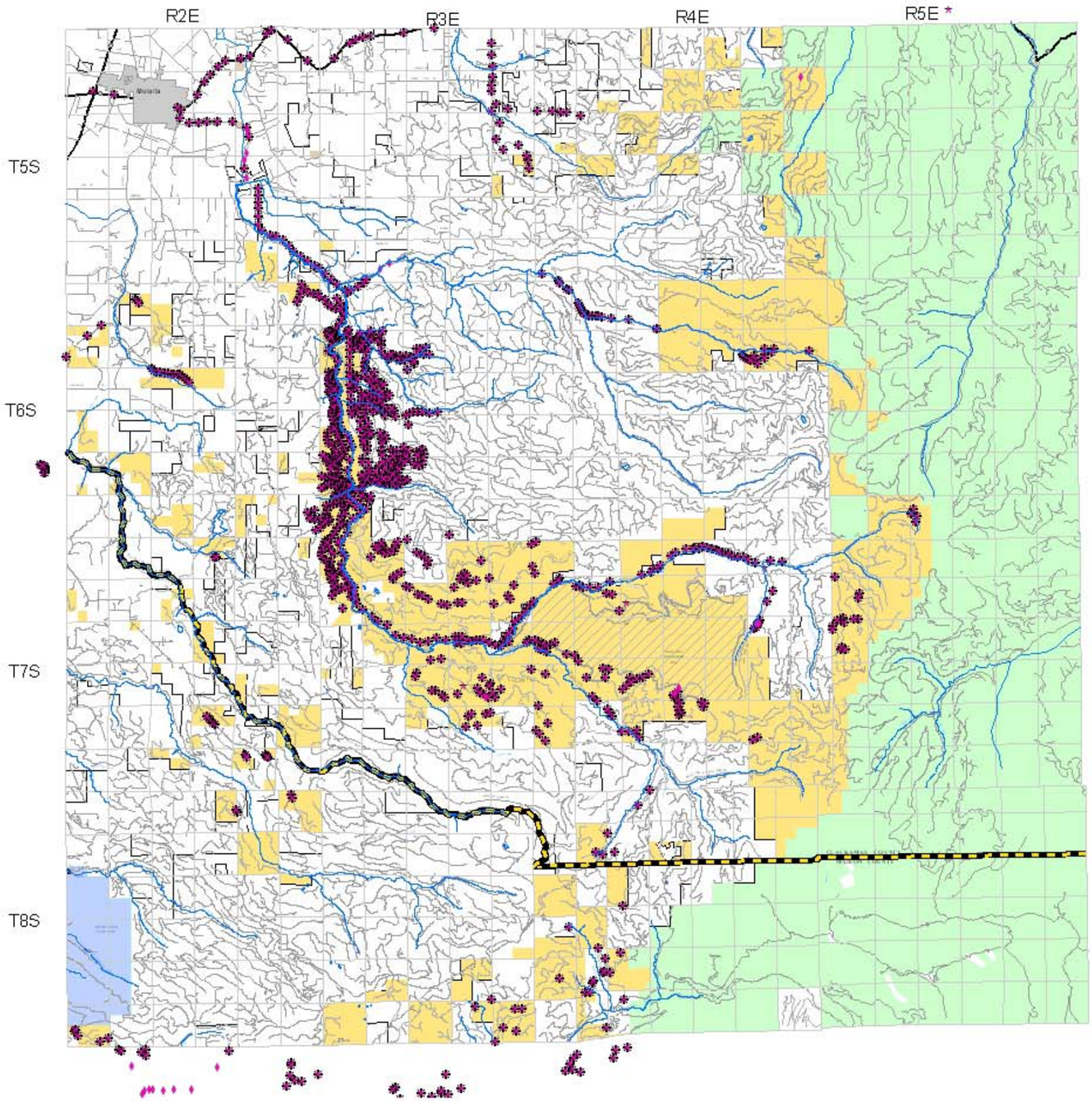
Cascades Resource Area
Invasive Non-Native Plants
EA Map 2 - Middle



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N

Legend

- Spotted knapweed
- Purple loosestrife
- Meadow knapweed
- Japanese knotweed
- Diffuse knapweed
- Scotch broom
- Streams
- Other Roads
- State Highway
- US Highway
- Table Rock Wilderness
- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Service
- Local Governments
- Other
- State of Oregon

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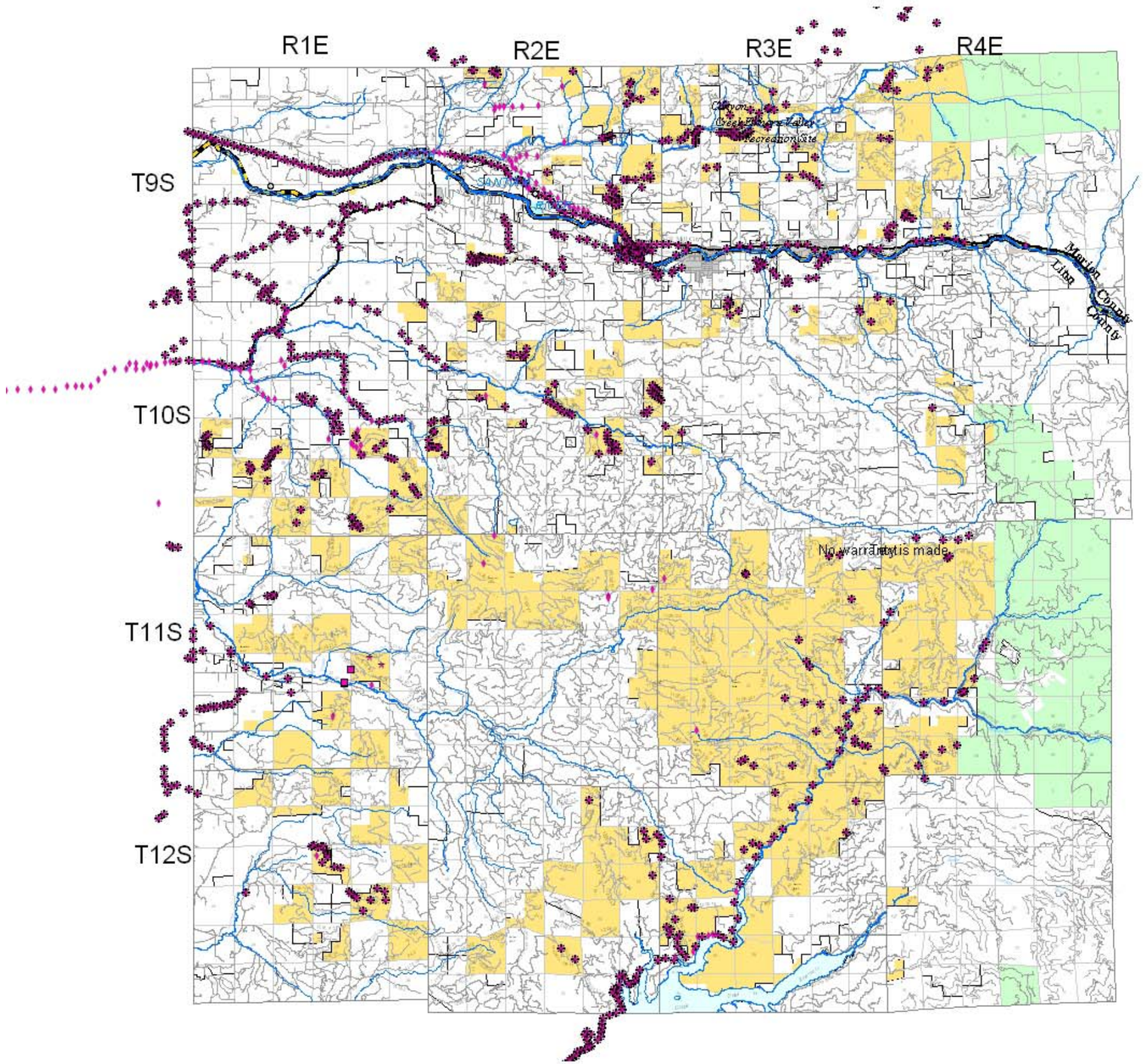
Cascades Resource Area
Invasive Non-Native Plants
EA Map 3 - South



1:167,793

N

Legend

- Spotted knapweed
- Scotch broom
- Meadow knapweed
- Japanese knotweed
- Diffuse knapweed
- streams
- Other Roads
- State Highway
- US Highway
- Recreation areas
- Bureau of Land Management
- US Forest Service
- US Fish and Wildlife Service
- Local Governments
- Other
- State of Oregon

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